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PERMANENT ADDRESS:

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THE UNIVERSITY OF ALBERTA

THE PSYCHOLOGY OF INTENTIONAL MODES

by

© EUGENE EGAN

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled 'The Psychology of Intentional Modes', submitted by Eugene Egan in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Psychology.

Wm. M. Rogerson
Supervisor

Brendan J. Rule

Kellogg Wilson

W. H. Schmidt

John Macnamara
External Examiner

Date. August 1, 1973

Abstract.

The concept of Intentionality is developed with particular emphasis on Intentional Modes. On the evidence of introspection and ordinary language, Intentionality is attributable not only to 'cognitive' or belief-like states, but also to a variety of others ranging from quasi-cognitive states like supposing and wondering thru emotional states like hoping and fearing to the complex system of speech-acts like advising, asking, or promising. On this interpretation, cognitive states are only one special case of mental states. An empirical illustration of this position was provided by scaling prosodic features of the English utterance 'On Sunday'. The position is not generally accepted in contemporary psychology and linguistics. More often there is a restriction of Intentionality to cognitive states on a priori grounds. The implications of this restriction were developed theoretically, and in two empirical studies, one on the formation of attitudes and the other on attitudinal behavior.

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Chapter 1. Introduction.

The dissertation to follow will be concerned with mental states. More precisely, it will be concerned with certain features of mental states, to be introduced in a moment as their 'intentional modes'. First, however, it will be useful to discuss the prior categories of 'mental' and 'non-mental'.

As far as common sense is concerned, mental states are those which involve ideas. And for common sense purposes, the term 'idea' is well enough understood to make the definition work. People's fears and hopes have something to do with ideas and are therefore mental; peoples heights and weights have nothing to do with ideas and are therefore non-mental. Rough distinctions between psychological concepts can also be made on this basis: 'attitudes' and 'cognitions' are surely mental in a sense which does not apply to 'habit-strengths' or 'reflexes'. Within cognitive psychology, however, the definition quickly fails, since many of the most frequently encountered terms are far too closely related to the concept 'idea' to be usefully classified by means of it. If one asks whether 'rules' or 'associations' involve ideas, the most likely answer is that it all depends on what is meant by 'ideas'.

Philosophy of mind has a partial remedy for this. Instead of asking, Which states are mental? it asks, Which descriptions of states are mental? If there is some agreement on the answer to the second question, then one is in a better position to answer the first, since it is likely that the peculiarities of mental descriptions will have corresponding peculiarities in the states so described. The philosophers have not, of course, come up with a straight answer to the second question. Nevertheless, in the course of the discussion, grammatic sentences in the form

'S øs that p' (1)

have emerged as the prototypes of mental descriptions for the following main reasons.

(a) By substituting a subject-term for 'S', a verb for 'ø' and a proposition for 'p', one always gets a sentence which fits the usual intuitions about what a mental sentence should be. Form (1) is the only one of this generality for which this is true. The 'subject-verb-object' form, for instance, gives 'John lifts Mary' as easily as 'John loves Mary'.

(b) A large selection of descriptions which are not in form (1) and which we wish to retain as mental, turn out to have paraphrases which include sentences in form (1). For example,

'S thinks a lot' (2a)

'S studies Latin' (2b)

'S knows Matrix Algebra' (2c)

depart from (1) only because they are global mental descriptions. If the component mental states were spelled out, form (1) would be found to fit many of them. Again,

'S is buying a car' (3a)

'S is writing a letter' (3b)

'S is welcoming the guests' (3c)

- all of which are intuitively mental - analyse into a variety of molecular beliefs, statements, intentions, etc., for which form (1) is appropriate, plus additional information about some of their non-mental concomitants. Similarly, perceptual descriptions like

$$\text{'S} \begin{bmatrix} \text{sees} \\ \text{feels} \\ \text{hears} \\ \text{etc.} \end{bmatrix} \text{X'} \qquad (4)$$

can be analysed into a mental component in the form

'S judges that an X is present' (5)

plus additional information about the means by which the judgment was made.

(c) The possibility, or impossibility, of partialling out a component in form (1) provides a rule of thumb which comes very close to our intuitions about which states make it into the category of 'mental' and which do not. For example, the appropriateness or inappropriateness of a description in the form

'S remembers that p' (6)

distinguishes nicely between the 'memory' which we feel to be mental and a variety of non-mental phenomena which are studied under the same label (c.f. Rozeboom, 1965). As another example, the impossibility of detaching a component in form (1) from most sentences like

$$\text{'S knows how to } \begin{bmatrix} \text{swim} \\ \text{dance} \\ \text{etc.} \end{bmatrix} \text{'} \qquad (7)$$

confirms our suspicions that they are only apparently mental. As a final example,

$$\text{'S says that p'} \qquad (8)$$

will be found to separate cleanly the 'sayings' that we feel are mental from other 'sayings' that we would prefer to call 'vocalizations' or 'recitations'. No matter how articulate our parrot is, we will not describe it as saying <u>that</u> Polly is pretty.

All of this is no more than to say that many of our intuitions about the mental are preserved in the rule that <u>all and only mental states take descriptions in form (1)</u>. There is no shortage of exceptions to the rule. There are senses of 'fears', 'enjoys' are 'dislikes' for which

$$\text{'S fears heights'} \qquad (9a)$$

$$\text{'S enjoys music'} \qquad (9b)$$

$$\text{'S dislikes Trudeau'} \qquad (9c)$$

will not support a propositional expansion of the terms 'heights', 'music' and 'Trudeau', respectively. And there is always the case of

where'knows' means 'is familiar with' and doesn't necessarily reduce to a set of beliefs. Cases like (9c) will be discussed further in Chapter 4, on the topic of 'attitudes'. The others will have to be admitted as exceptions which still do not take away the special status of (1) among mental descriptions.

With (1) as the paradigm case, it is clear that a mental description as a whole can be true even when the embedded clause 'p' is false. It can be true that I believe that p, while it is not the case that p. This feature and others have been used by philosophers (e.g. Chisholm, 1965) to give a formal characterization of mental descriptions - or, as they prefer to call them, 'Intentional Sentences'. The use of the term 'intentional' here is a reference back to some scholastic philosophers who were concerned with the same problem, and for whom the term 'intentio' would have meant, simply, 'idea'. In itself, therefore, talking about 'intentional' states and descriptions is no nearer to defining 'mental' than talking about 'ideas'. However, the older term has some overtones which the scholastics and their recent revivers have used to make a theoretical point. Corresponding to the noun 'intentio' there is the verb 'intendere' which means 'to aim or point' something at something else. An idea, therefore, becomes that something-or-other which directs a psychological state at something outside itself and thereby gives it a potential target in the world of objects. If an idea is the 'aim' of a mental state, there arises a sharp dist-

inction between the content and the object of that state: the content of a mental state is its own internal articulation in virtue of which that state would, under certain circumstances, hit a target or be about, something in the world of objects. Thus, the psychologist can accept descriptions in form (1) even when it is clear that the proposition 'p' refers to nothing in the real world.

The 'intentionality' of psychological states, and the derivative 'intentionality' of their descriptions, refers, therefore, to the fact that they have contents. In descriptions of form (1) the content is the substitution for 'p'; in the state itself, the content is a theoretical, psychological property - to be further discussed in Chapter 3. In current philosophy of mind, 'intentionality' is considered to be the definitive property of mental states, and from now on in this dissertation, the terms 'mental' and 'intentional' will be used synonomously. There is no essential relationship between 'intentional' in this sense and 'intentional' in the ordinary sense of 'deliberate'. But there is an accidental relationship between the terms, since deliberate states of mind have contents and are therefore a special case of intentional states. As we will use the term 'intentional', the verb 'intends' is intentional; but no more so than 'believes' or 'hopes' or 'fears'.

If 'intends' and similar verbs have no special status among intentional verbs, neither does any other group. This is the case at least, if we are to go on the evidence of ordinary usage and introspection. One

finds 'requests', 'is annoyed', threatens', etc. for 'ϕ' as well as 'believes' or 'says' and nobody feels that it is any more difficult to specify 'p' in one case than in the other. To the extent that form (1) is paradigmatic of mental descriptions, this means that threats, requests and annoyances are no less intentional than beliefs or statements. One may go beyond this evidence, of course, and find reasons in theoretical psychology or elsewhere, to give special status to the intentionality of certain verb-groups and their corresponding mental acts. This has long been the practice in psychology, where the 'cognitive' group is considered pre-eminent to the point that the term is often used synonomously with 'mental'. This usage will not be followed here. In keeping with its etymology ('cognosecere' for 'to know') the term 'cognitive' will be used to describe the subset of mental states which potentially yield 'knowledge'. Memories, beliefs and percepts are therefore 'cognitive', while hopes and fears are not.

This brings us, finally, to the matter of intentional 'modes'. The point has just been made that ordinary usage does not single out any group of mental states as more intentional than any other. At the same time, there are some obvious groups among the common verbs - the cognitive group, for example, and, by way of contrast, the emotional group consisting of 'is glad', 'is sorry', 'is angry' and the like. Since we are deciding to stay with the evidence of ordinary usage, mental groups like these will be called 'intentional modes' (c.f. Rozeboom, 1972, p38). The expression is appropriate because it emphasizes the primacy of the concept of intentionality in a general treatment of mental states, and the indifference of the concept to many of

the more visible distinctions of contemporary psychology, such as that between afferent and efferent processes, or between cognitive, affective and conative states. Since, as we will later argue, the attribution of intentionality is not prejudiced by many such classifications, from our point of view 'cognitions', 'emotions', 'conations', 'perceptions', and the many categories of ordinary language, are appropriately thought of as so many 'modes' in which intentionality is realized.

A more urgent reason for choosing the expression 'intentional modes' is that the more familiar names for the main groups of mental states invariably have the kind of presuppositions about intentionality which this dissertation is trying to avoid. As an example, consider again the two groups, 'emotions' and 'cognitions'. A look at the psychology of emotion shows that while the intentionality of cognitions is considered to be unproblematic, the intentionality is outrightly denied and treated in almost every case as a special instance of the intentionality of a cognition. It seems as if there is a theoretical dogma in effect, which says that only cognitions can be intentional - the dogma of the single mode. From William James (1884) down to Schacter (1964) this article of faith has scarcely been challenged. The refutations and modifications of the original idea (that having an emotion is feeling some organic change in oneself) all follow the same argument that since emotions are about something, then they must be cognitions or beliefs of some sort, which leaves beliefs about the emotion itself as the only plausible candidates. And so the controversy has been restricted to a dispute about the precise nature of the cognitive mode in which emotions are detected. James himself debated whether one <u>senses</u>

or feels the organic change, or whether one rather becomes acquainted with it - which he took to be something quite different (c.f. Natsoulas, 1973). Along similar lines, Meyers (1969) argues that it is not the mere awareness of somatic disturbances but how they feel which constitutes emotion'. And Schacter's point is that emotional awareness is not just noticing or sensing one's changed condition but more like interpreting or labelling it (i.e. theoretically inferring it). In any case, it has rarely been doubted that emotional awareness is a cognition of some sort, and that its content refers to a condition of the subject.

But one may well doubt that this is the case. There is experiential evidence that many emotions are not like cognitions of any variety and that their contents refer, for the most part, to conditions in the world, not in the subject. The fact that an emotion may be based on a cognition or be its object (and vice versa, for that matter) is beside the point here.

> Certainly, it is always possible to become aware of emotion as a fact of consciousness, as when we say: I am angry, I am afraid, etc... But the fear does not begin as consciousness of being afraid, any more than the perception of this book is consciousness of perceiving it.... It is obvious indeed that the man who is frightened is afraid of something. And without doubt, all the psychologists have noted that emotion is touched off by some perception... But for them, as it appears, emotion then parts company with the object to become absorbed in itself. Little reflection is needed to discover that on the contrary, emotion returns to the object time after time and feeds upon it. (Sartre, 1962, p56).

It is absurd to describe a cognition, such as 'perceiving this page', as 'perceiving a percept of this page' when the concepts of 'perception' and 'this page' are already sufficient to describe the situation. Sartre is arguing that there is a similar error in describing 'being annoyed

that p' or 'being glad that q' as perceptions of internal states concerning p and q. To assume that the paraphrase is explanatory in the second case but not in the first is to subscribe to the dogma of the single mode.

There is no need to go into the relative merits of phenomenology and empiricism. In reality, the present instance of the dogma is the result not of an oversight so much as a decision to study emotion, for better or worse, in terms of physiology and self-perception. Phenomenology, for its part foregoes the advantages of the empirical method in order to do justice to the subtle changes in mental contents as the world is alternately 'seen as' dramatic or prosaic, sacred or profane, personal or impersonal. For the purposes of the present dissertation, phenomenology is no more suitable than the reductive empiricism which is responsible for the dogma of the single mode, since the phenomenologists, too, have been preoccupied with the perceptual mode. The point of bringing up these contrasting methodologies was to show that the topic of intentional modes forces one to share some of the concerns of both sides. Like the phenomenologist one has to assume that fearing and hoping are different from perceiving or feeling and that there is no possibility of paraphrasing one in terms of the other. More in the spirit of empiricism, contents will be considered invariant across modes, thus cutting short the phenomenologist's idea that different modes of awareness constitute different 'worlds' which cannot be detached from their respective modes.

The practical consequences of this method will become clearer in the empirical studies of the next chapter. It does not involve any novel insights, however, since it is already implicit in the ordinary usage of mode-verbs followed by contents which are supposed to be independent of them and are grammatically indicated as such. The purpose of the chapter will be to avail of the discriminations in the common usage of mode-verbs so as to extract from them the principal dimensions of modal entertainment.

Chapter 2. Intentional modes in ordinary language.

In the previous chapter it was claimed that ordinary usage does not reduce modes in general to cognitions. If this is the case, then it should be possible to construct from the linguistic and perceptual sensitivities of the naive subject, a general model of mode-space. This is the main objective of the present chapter and, in particular, of the two studies reported in it.

The first indication that ordinary usage does not subscribe to the dogma of the single mode is the large range of verb-phrases which can substitute for 'ø' in sentences of the form

'S øs that p'. (1)

According to the dogma, all sentences in this form which do not already refer to a belief or a sensation, have a paraphrase in the form

'S [finds / feels / judges / believes / etc] that he is ø-ful that p'. (2)

But while it was granted that this rephrasing sets up interesting questions concerning the awareness of physiological changes, it is doubtful if it is really a paraphrase.

Up to now, the only evidence presented for this was the shift we seem to experience in going from states described in form (1) to states described in form (2). Now that the matter has been put in terms of ordinary language expressions, there is stronger evidence. There are many verbs like 'promises' or 'advises' or 'requests' which fit easily into form (1) but have no plausible paraphrase in form (2). In fact, the usefulness of form (2) appears limited to 'emotional' verbs. One can make a case for rewriting 'is angry that' as 'believes that he is angry that', or 'is glad that' as 'believes that he is glad that', since anger and gladness may be partially defined by non-mental descriptions and the corresponding modes partially explained in terms of self-perception. But the 'emotional' mode verbs form only a small group of the verbs capable of substituting for 'ϕ' in (1). If 'promises' is rewritten as 'believes that he is promising' nothing is gained since a physiological or an experiential identification of the state of promising is out of the question and the perception of such a state on cues of this kind is a fiction.

More telling still, even if it is conceded, for the sake of argument, that all sentences in form (1) may be paraphrased in form (2), one may dispute the dogma all over again by asking whether, as well as finding, feeling, judging, etc. that one is ϕ-ful that p, one may not also be glad, or amused, or worried that this is the case. On the evidence of introspection, the answer is 'Yes', since meta-modes of this variety are considered commonplace. I may be worried that I am unconcerned about wars, or amused that I dislike ceremonies. In fact, the philosopher Körner (1972) considers that reflexive mental acts like these make up

the bulk of what is ordinarily meant by the term 'morality'.

So, whatever the advantages of rephrasing from (1) to (2) there is no evidence for any such practice in naive mentalism. Modal differentiation is not only tolerated but has been used to build up a system of mental-act verbs of astonishing richness and complexity. Austin (1962) has estimated that the linguistic mode-verbs alone ('says', 'orders', 'sneers', 'chuckles', etc.) number about 1,000. Moreover, the use of these verbs is highly sensitive to collateral information about the actions they describe. For instance, descriptions in the form 'S says that p' will not be used of taperecorders or people doing speech exercises. But this simple restriction involves other beliefs about the kinds of systems which can be said to understand something, believe it, utter it with the intention of being believed, and so on. This has important implications for the interpretation of modes as psychological constructs and will be the topic of chapter 3. In the present discussion it makes the point that ordinary language has the equivalent of a <u>theory</u> of mode-verbs, since their usage is controlled for the most part by contextual information and only very little by immediate observation. Thus 'says that p' may be inappropriate for some cases of speech, even when the articulation is perfect; and it may be appropriate for a piece of handwaving or a computer printout, even when there is no speech at all.

The theory behind naive mental descriptions has not gone unnoticed. It is the preoccupation of philosophy of mind, which tries partly to desc-

ribe it and partly to improve on it by inferring what it must be, given its surface-features. Thus the rules governing the predicate 'knows that p' gave rise to the standard philosophical definition of 'knowledge' as 'justified, true belief'. The definition is important in subsequent philosophical discussion of mode-verbs. Gordon (1969) claims that emotional mode-verbs can be divided into those which entail 'knows that p' and those which entail its negation. The first category would include 'is glad', 'is amused', 'is annoyed', and the second category 'hopes', 'fears', and 'worries'. Unger (1972) developed this idea, pointing out the interesting grammatical fact that when a mental verb entails the negation of its content (e.g. 'prevents', 'refutes') some 'extra wordage' is generally required to make the 'S ϕ's that p' form grammatical. You cannot say 'S prevented that p' or 'S refuted that p' but only something like 'S prevented it from being the case that p' or 'S refuted the claim that p'.

While philosophers of mind have uncovered many of the subtleties of naive mentalism, their more general statements about mental states and their modes tend to rely too exclusively on linguistic evidence, at the expense of psychological plausibility. In contrast, the two studies to follow are concerned primarily with psychological plausibility and have as their objective a description of the main dimensions underlying the naive predication of modes. This raises a problem since the point has just been made that naive mental predications are 'theory-laden' and suggest the sort of reconstruction which the philosophers have given them. To avoid this, naive predications were studied in a highly restricted setting: Ss were allowed to make only judgments of similarity

or difference between modes on a single scale. Consequently, a similar restriction applies to the interpretation of models of such judgments.

There is no a priori reason to think that statements about intentional modes are going to be any truer or more useful if they are grounded in empirical descriptions of this sort. The reason for this is that all comprehensive statements about mental states are so highly undetermined by all possible data that, other things being equal, it is of little importance that one is derived quantitatively and another is not. An instance of a non-quantitative conclusion on intentional modes is Rozeboom's (1972, p88) claim that the important dimensions of propositional entertainment are '(1) degree of belief-commitment, (2) valuational tone, (3) intensity of arousal or awareness, and (4) a passivity/activity dimension which might be called 'engagement' or 'salience'...' In its formal structure, the statement is exactly of the kind which we wish to extract from the studies to follow. On the other hand, the studies are in no sense a 'test' of this claim but simply another way of generating such claims.

Nevertheless, there is a strong argument for generating claims in this way. It is called 'the principle of weak dominance' (Edwards, Lindman and Phillips, 1965) and it says that if one course of action promises to turn out, at worst, no worse than the alternative, and at best, better, then one ought to choose it. So, if philosophers (as I believe) do not increase or decrease the plausibility of their statements by deriving them in a scrupulously unempirical manner, by proceeding empirically one can produce an abstract theory which is at worst as good as

theirs, and at best, good psychology as well.

Studies 1 and 2 were undertaken with this in ming. They jointly attempt to identify the principal dimensions underlying naive judgments of modal similarity.

Study 1.

A trained speaker recorded the phrase 'On Sunday' in as many tones of voice as possible. From an original pool of some 100 utterances, the speaker and the experimenter created a sample of 17 by adding only those items which sounded quite different from all of those already in the sample. These were then transcribed on a separate tape and presented to 15 Ss. The stimuli were repeated at will, and Ss described each one by means of a checklist of 24 modal descriptions of the speaker. The list was

She recommends (that it be on Sunday)
She's interested (that it is on Sunday)
She wants it to be (on Sunday)
She believes (that it is on Sunday)
She hopes (that it is on Sunday)
She's amused (that it is on Sunday)
She's glad (that it is on Sunday)
She's asking (if it is on Sunday)
It bugs her (that it is on Sunday)

She knows (that it is on Sunday)

She's excited (that it is on Sunday)

She doubts (that it is on Sunday)

She's worried (that it is on Sunday)

She can't believe (that it is on Sunday)

She requests (that it be on Sunday)

She's sure (that it is on Sunday)

She orders (that it be on Sunday)

She suspects (that it is on Sunday)

She thinks (that it is on Sunday)

She's concerned (that it is on Sunday)

She wonders (if it is on Sunday)

She fears (that it is on Sunday)

She expects (that it is on Sunday)

She's surprised (that it is on Sunday)

The selection of mode-verbs was arrived at partly from the results of pilot studies (see Appendix 1, p83) and partly from the inventories found in philosophical works such as Searle (1970). On hearing an utterance ('On Sunday') Ss rated each of the verbal descriptions of the speaker for appropriateness on a 7-point scale (see Appendix 1, p83). The data was scored from 6 (highly appropriate) to 0 (highly inappropriate) yielding a 24x17x15 matrix of proximities. The appropriateness of each description for each stimulus was then summed across the 15 Ss and a correlation matrix for the descriptions was obtained from this 24x17 matrix. (See Figure 1).

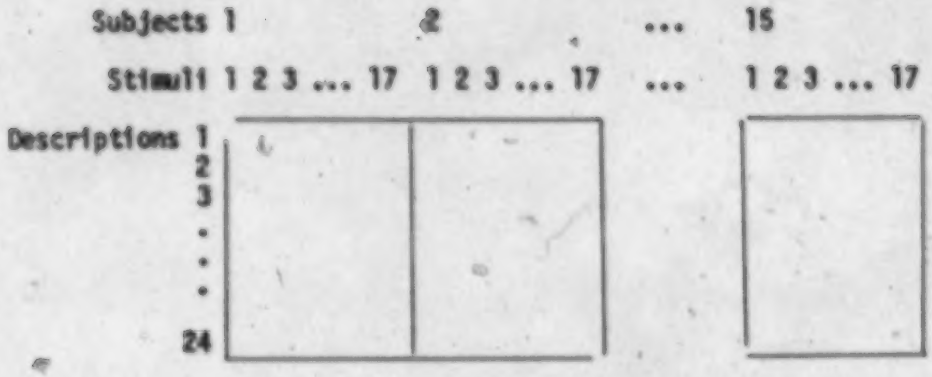

Figure 1. Matrix of raw data for Study 1.

h^2		I	II	III	IV	V
85	She recommends	-14	85	-17	-25	-09
95	She's interested	32	76	-31	38	15
99	She wants it to be	-02	89	-30	-17	-27
96	She believes	-97	02	02	-03	-13
97	She hopes	09	92	-31	-06	-14
84	She's amused	-01	25	-87	17	01
99	She's glad	-21	58	-73	27	03
95	She's asking	93	-16	03	20	15
95	It bugs her	-22	-73	59	-02	-10
92	She knows	-91	-27	-13	01	03
92	She's excited	-03	51	-16	78	-17
95	She doubts	96	-16	01	02	04
93	She's worried	17	-56	75	13	13
89	She can't believe	18	-28	01	88	05
93	She requests	67	53	-01	-44	-13
98	She's sure	-98	-06	-06	-10	01
81	She orders	-29	34	40	-27	-62
89	She suspects	46	01	18	-22	77
91	She thinks	-35	-22	20	24	80
90	She's concerned	16	-29	86	14	15
99	She wonders	94	06	09	12	27
91	She fears	05	-70	57	22	19
79	She expects	-87	01	-04	-02	19
95	She's surprised	11	-20	05	93	18
	% of total variance	31	24	16	13	09

Table 1. The varimax factors of Study 1.

This correlation matrix was then factor analysed by the Principal Components method and rotated to an orthogonal (Varimax) solution. The five factors obtained are presented in Table 1.

I (reflected)		II		III	
She's sure	98	She hopes	92	She's amused	-87
She believes	97	She wants it to be	89	She's concerned	86
She doubts	-96	She recommends	85	She's worried	75
She wonders	-94	She's interested	76	She's glad	-73
She's asking	-93	It bugs her	-73	It bugs her	59
She expects	87	She fears	-70	She fears	57
She requests	-67	She's glad	58		
She knows	91	She requests	53		
		She's excited	51		

IV		V	
She's surprised	93	She thinks	80
She can't believe	88	She suspects	77
She's excited	78	She orders	-62

Table 2. Loadings of 50 and greater on the factors of Study 1.

With the help of Table 2, the factors are tentatively interpreted as CREDENCE, OPTION, SALIENCE, AROUSAL and WEAK BELIEF. They are in close agreement with factors found in pilot studies (see Appendix 2, p85) and some of the interpretations were made with this in mind. As in all previous analyses, there are two belief-factors, the first (Factor I above) marked by verbs like 'knows', 'is sure', 'sees', 'remembers', and the second (Factor V above) by 'thinks', 'suspects', 'feels', and 'guesses'. The interpretation of these factors will be discussed further in the next paragraph. In the present study there are additional loadings on the factors: 'requests' and 'asks' on CREDENCE and 'orders' on WEAK BELIEF. This is to be expected since 'requests' and 'asks' both

presuppose 'doesn't know'. According to Searle (1970, p66) the same is true of 'orders', though our analysis suggests that it may be less so since 'orders' loads on WEAK BELIEF. The factor interpreted as OPTION combines positive evaluation and commitment to action. In pilot studies verbs such as 'intends' and 'is determined' loaded on it. These were not included in the present list because they are relevant to few if any recognizable tones of voice. AROUSAL and SALIENCE were also encountered before. SALIENCE is distinguished from OPTION by markers like 'is concerned' which lack the 'optative' character of Factor II.

The fact that CREDENCE and WEAK BELIEF are separate factors is contrary to our intuition of a single belief-dimension with CREDENCE-verbs at the extremes and WEAK-BELIEF-verbs in between. This is the intuition which leads us to think, for example, that 'knows' is a special case of 'believes'. The intuition may be abandoned, of course, in deference to the present evidence which shows two, orthogonal belief-factors. Moreover, the move could be supported by citing some ordinary usages which are also at odds with the idea of a single dimension. For instance, 'knows' is sometimes used as an implicit denial of 'believes'.

On the other hand, the present findings are not necessarily in conflict with the intuition of a single belief-dimension. With a different, and perhaps more plausible, model of the Ss' ratings, the two manifest factors in linear factor-space can still be reduced to one. According to the model assumed so far, given a dimension F, a verb-phrase v,

and a stimulus s, the appropriateness of the verb to the stimulus (A_{vs}) is given by

$$A_{vs} = b_v F_s \tag{3}$$

where b_v is the loading of the verb on the dimension, and F_s is the location of the stimulus on it. Instead, however, appropriateness may be considered as a function, not of s's location on F but of its distance from an ideal location, C_v on F. Appropriateness is now

$$A_{vs} = b_v(F_s - C_v)^2 \tag{4}$$

where the distance has been squared merely to eliminate directions. There should be another parameter in the equation to represent how steeply appropriateness falls off from the ideal point. But this is the same as the salience of F for v and may be absorbed in b_v. For the case of k dimensions, and assuming conjunctive judgments

$$\begin{aligned} A_{vs} &= \sum_k b_{vk}(F_{sk} - C_{vk})^2 \\ &= \sum_k (b_{vk}F^2_{sk} - 2C_{vk}b_{vk}F_{sk} + C^2_{vk}b_{vk}) \\ &= \sum_k b_{vk}F^2_{sk} - \sum_k 2C_{vk}b_{vk}F_{sk} + \sum_k C^2_{vk}b_{vk} \end{aligned} \tag{5}$$

Since the last term is constant for a given value of v, appropriateness is now given by two terms which are, respectively, quadratic and linear composites of the same variable, F_k . Thus, while these terms are perfectly predictable from each other, they are not linearly so. Moreover, for extreme values of C (when the verb's ideal point is at

the end of the dimension) the variance attributable to the first component will be negligable; while for values of C_v close to the mean, the same will happen to the second component. Thus the obtained factor structure is not incompatible with the original idea that CREDENCE and WEAK BELIEF are regions of a single dimension.

Accepting the interpretation of the factors for the moment, a more fundamental objection to the model is that the relation between intentional modes is too complex to be accounted for in any distance-model. The objection would have to grant that some of the distinctiveness of, say, 'warns' or 'advises' or 'promises' can be captured by their projections on CREDENCE, OPTION, and so on. On the other hand, there is little doubt that the meaning of many mode-verbs derives from a complex of situational features in a manner that can hardly be represented in a spatial model. 'Requests', for example, implies that what is requested is an action of a person, that the action is wanted by the person requesting, that he believes the requested party is able to do it, but normally would not without the intervention of the request, and so on. (C.f. Searle, 1970).

This point has to be conceded. There is no possibility of recovering all the nuances of ordinary language mode-verbs from a representation in which they appear only as points in space. But the nuances of mode-verbs taken singly is not as important to the present dissertation as are some theoretical claims about the nature of modes in general. In particular, there is the claim that with respect to the prior concept of intentionality, modes form a homogeneous group and that its main

members may be identified. And there is the accompanying claim that contemporary psychology is reductionistic in this regard since it tries, where possible, to deal with modes of awareness other than beliefs by projecting them as contents within the belief-mode. The spatial model makes a suitable backdrop to these claims, emphasizing as it does, the homogeneous nature of the mode-group as a whole, and de-emphasizing the cognitive sub-group. Conversely, these claims tend to be blurred if the details of single mode-verb are spelled out as a set of propositional contents within the belief-mode. Thus the models of Searle (1970) and Schank (1973) are compatible with the dogma of the single mode. (In Searle's analyses one admittedly encounters the occasional 'wants'; in Schanck all mode-verbs are systematically translated in terms of three act-verbs which are explicitly cognitive.)

The limitations of the model, therefore, are accepted in the hope that its theoretical implications will be clearer. These implications will be discussed in the next chapter, and in Chapter 4 they will be given some empirical applications. At this point all that is being claimed is that there are five, and possibly more dimensions underlying naive modal descriptions. Since these dimensions were inferred from the correlation of verbal descriptions over a sample of intonations, it may be asked if the same structure can be recovered from perceptual judgments made on the same material without overt use of verbal descriptions. This was the question to which Study 2 was addressed.

Study 2.

The same seventeen utterances from Study 1 were transcribed in all possible 136 unordered pairs. A second tape was made of the same pairs with the order of each pair reversed. The material was then presented to 15 Ss (different from those in Study 1), 8 of them receiving the first order, and 7 the second. They were instructed to compare the speaker's 'frame of mind' from one utterance to the next, and to rate the pair for similarity in this respect. (For further details, see Appendix 3, p93). The ratings were made on a 7-point scale labeled, from left to right, very similar, similar, somewhat similar, can't decide, different, very different, opposite. The data was scored from 6 (very similar) to 0 (opposite), yielding a 15x136 matrix of proximities. (See Figure 2).

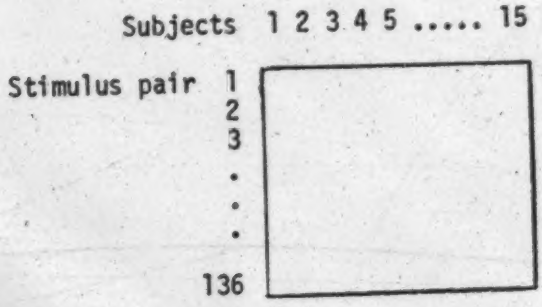

Figure 2. Matrix of raw data for Study 2.

The proximities were then summed across Ss for each stimulus pair, and the 25 stimulus points were located in a spatial configuration using Kruskal's method (Kruskal, 1964a, 1964b). This method fits the points

to the requirement that

$$d_{hi} \leq d_{jk} \iff \delta_{hi} \geqslant \delta_{jk}$$

where d_{hi} is the distance between stimuli h and i in the spatial configuration, and δ_{hi} is the rated proximity of h and i, summed across Ss. The fitted distances may be computed by any distance function. For the present data, the city-block metric was used since it has the least assumptions about the nature of the judgments giving the δ_{hi}. Deviation from monotonicity is given as

$$\text{Stress} = \sqrt{\frac{\sum_{ij} (d_{ij} - \hat{d}_{ij})^2}{\sum_{ij} d^2_{ij}}}$$

where the $\hat{d}_{ij}$ are 'pseudo distances', monotonic with the δ_{ij} and a least squares fit to the d_{ij}. Thus, without the square root and the scaling factor Σd^2, Stress is a residual sum of squares. As for evaluating the Stress of a solution, Kruskal suggests that 'a minimum stress configuration whose stress is above 20% is unlikely to be of interest; above 15% we must still be cautious; from 10% to 15% we wish it were better; from 5% to 10% is satisfactory; below 5% is impressive'. (Kruskal, 1964b, p119).

For the present data, Figure 3 gives Stress as a function of the number of dimensions used. The solution in five dimensions was selected, It is presented in Table 3 and plotted in Figures 4, 5 and 6.

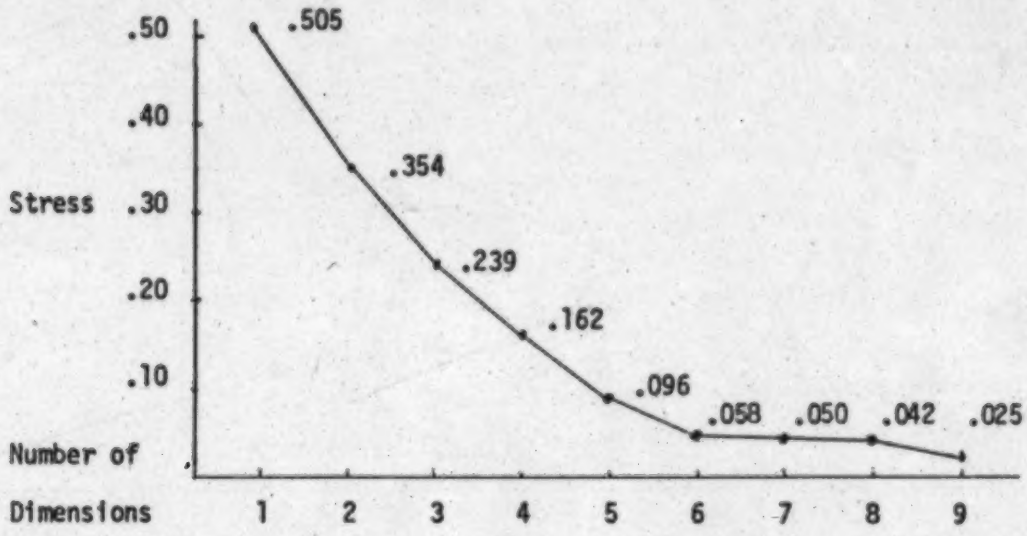

Figure 3. Stress as a function of number of dimensions in Study 2.

	Axes	1	2	3	4	5
Intonations	1	0.052	-1.218	-0.038	0.054	-0.044
	2	-0.392	0.386	-0.511	-0.206	-0.131
	3	-1.075	0.096	0.102	-0.012	0.045
	4	0.194	-0.109	-1.118	0.136	0.071
	5	0.098	-0.005	0.119	-0.972	-0.014
	6	0.160	0.009	0.039	-0.979	0.002
	7	0.168	0.103	-0.035	-0.147	-1.102
	8	-0.284	-0.174	0.558	0.007	-0.490
	9	-0.477	-0.461	0.031	0.438	-0.214
	10	-0.053	-0.305	-0.268	-0.205	0.588
	11	1.125	0.160	-0.229	-0.007	-0.148
	12	-0.068	1.072	0.031	-0.062	-0.064
	13	-0.052	0.051	1.070	0.132	-0.080
	14	-0.139	0.027	-0.222	1.069	-0.177
	15	0.039	0.009	-0.033	0.021	1.175
	16	0.607	0.295	0.161	0.205	0.155
	17	0.096	0.385	0.341	0.491	0.279

Table 3. Loadings of intonations on the Kruskal axes of Study 2.

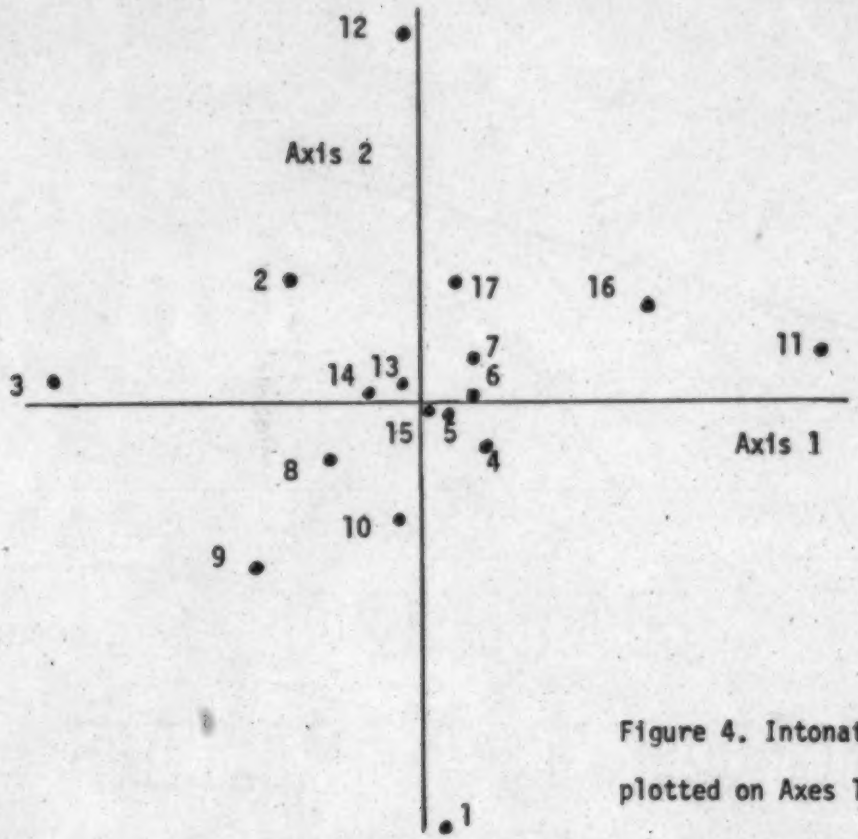

Figure 4. Intonations plotted on Axes 1, 2.

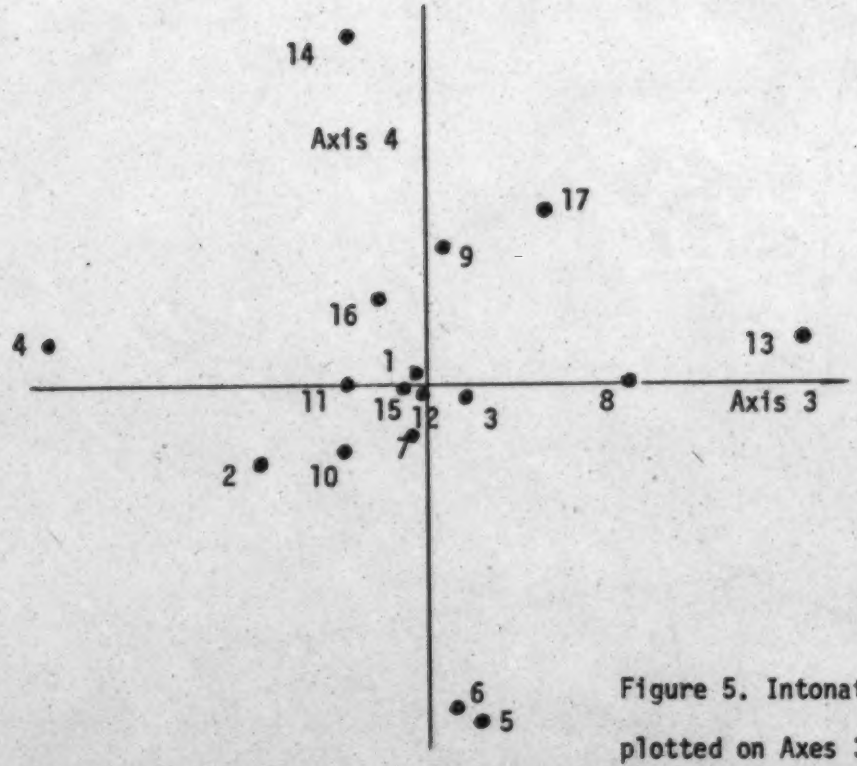

Figure 5. Intonations plotted on Axes 3, 4.

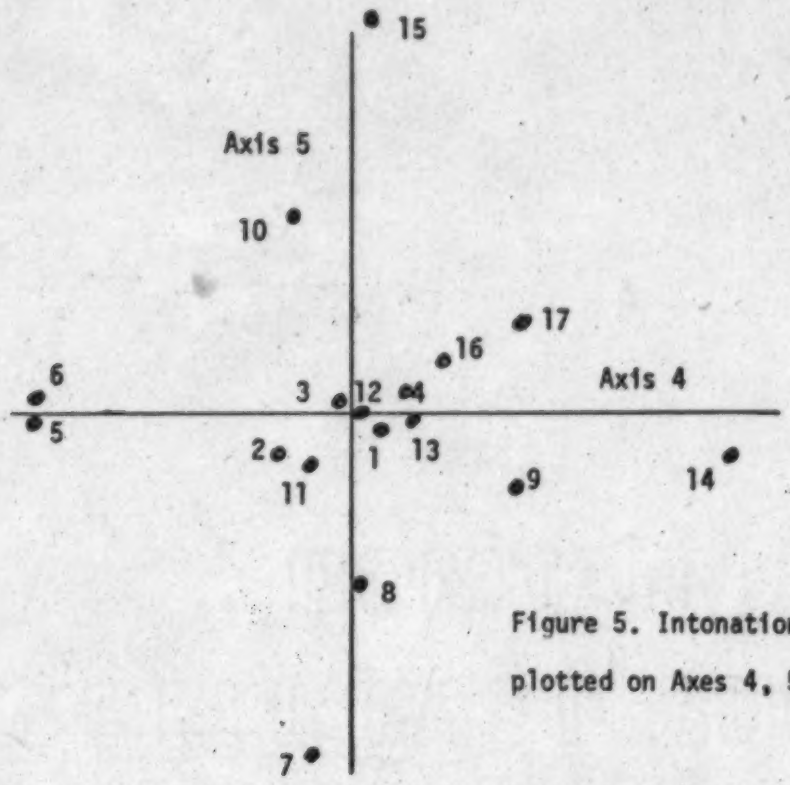

Figure 5. Intonations plotted on Axes 4, 5.

Ideally, the obtained axes whould be interpreted directly from the stimulus material which gave rise to them. With acoustic material, however, this becomes impossible. One cannot remember the intonations long enough to tell what they have in common. Listening to the intonations ranging from high to low on the Kruskal axes, or in any other grouping, creates a very confused impression in which only the contrast between positive and negative affect stands out. Since the Kruskal configuration seems to require at least five dimensions, it is evident that difference judgments made on pairs of intonations produce a more complex structure than can be arrived at by attempted groupings. But the problem of interpreting the more complex structure still remains.

To solve the problem, it is necessary to translate the intonations into some medium in which they can be examined simultaneously. Only then will it be possible to detect higher-order features. This is easy to do in the present case, since verbal descriptions of the intonations are already available from Study 1. One could, for instance, replace each intonation by its most common description and then interpret the axes from the projections of the descriptions on them - exactly as the factors of Study 1 were interpreted. This however would raise again some questions about the dimensionality of the descriptions. And since these questions have been tentatively answered in Study 1, the intonations were replaced not by their most common description but by their locations in the factor space for descriptions, i.e. by their factor scores on CREDENCE, OPTION, SALIENCE, AROUSAL and WEAK BELIEF. The location of the intonations on the Kruskal axes was then regressed linearly on these factor scores. The results are presented in Table 4.

Dependent variables:	Independent variables: Factors					
	I (Cr)	II (Op)	III (Sa)	IV (Ar)	V (WB)	R
Kruskal axes 1	.06	-.14	.26**	.14	-.08	.75
2	.13	.01	-.18*	.22*	-.05	.69
3	.09	.21*	-.20*	.03	.08	.71
4	-.25**	.02	-.12	.08	-.28**	.86
5	-.08	-.14	-.01	.14	.22*	.72

* $p < .05$; ** $p < .01$

Table 4. Beta coefficients and multiple correlations for the regression of locations in the Kruskal configuration on factor scores.

Before interpreting the results, it should be recalled that the Kruskal configuration was obtained from proximity judgments made directly on the intonations themselves. Ss were simply to say how closely the speaker's frame of mind in one utterance matched that in another. There was no obvious intervention of verbal labels for the intonations. On the other hand, the mode-factors reflect nothing more than the co-variation of verbal labels across a sample of intonations. In addition, no effort was made to rotate the axes of the two configurations into a position of maximum congruence.

In spite of this, the results of the regression analysis show a reasonable identification of the Kruskal axes in terms of the factor space for descriptions. The first Kruskal axis is identified by SALIENCE, and the third jointly by SALIENCE and OPTION. The fourth axis is probably the asking vs telling dimension, already well researched in linguistics (e.g. Fries, 1964, Hadding-Koch and Studdert-Kennedy, 1963). It is of interest that the axis no longer preserves the distinction between CREDENCE and WEAK BELIEF since it is predicted by both together. This is probably due to the different tasks facing Ss in Studies 1 and 2. In Study 1, the S completing a checklist of mode-verbs may well respond to 'theoretical' distinctions lodged in the usage of such verbs - such as the well-known opposition between 'knows' and 'thinks'. This distinction is unlikely to influence judgments in Study 2, since the intonations on their own tend to emphasize the more pragmatic and exclusive distinction between asking and telling. The second axis aligns with AROUSAL and also with SALIENCE ; the fifth mainly with WEAK BELIEF.

In brief, therefore, Study 1 shows that there are five, and possibly more,dimensions underlying naive modal judgments based on intonational cues; and Study 2 confirms that a similar structure can be obtained from judgments made directly on the intonations without the use of verbal descriptions.

There are several difficulties with these conclusions. Already, the question of the appropriateness of spatial models was raised. But even if the objections in this regard are overcome, there are questions about the specificity of the obtained configuration (a) to intonational cues, and (b) to the type of content on which they were imposed here. It will not be possible to answer these objections fully, since the answer is largely a matter for further empirical study. There are, nonetheless, reasons for thinking that the kinds of cues and content used here will yield a mode-structure which is at least as general as any that can be obtained by other means.

As far as modal cues are concerned, one could, of course, use facial expressions or the semantic features of a selection of mode-verbs. It can be seen from the pilot studies in Appendix 2 that the latter method produces a factor structure very similar to that obtained in Study 1. But, even if there were no similarity at all, the results of the pilot studies would argue that the intonational structure should be preferred. This is because of the problem of unstable content when semantic judgments are made on mode-verbs. (For more details, see Appendix 2, p). This problem is uniquely overcome by intonational cues since they are necessarily accompanied by the segmental sounds

which convey content. The problem of unstable content also arises with facial expressions since the expression itself cannot convey what it is about. In addition, it is doubtful if the range of modes conveyable in this manner is more than a subset of those conveyed either by mode-verbs or by intonations.

A similar argument can be made in favor of the type of content used in Studies 1 and 2. Of all conceivable contents, it is the variety most likely to yield a mode-structure that is not content specific. To make this claim it is necessary first to point out an important methodological difference between Studies 1 and 2 and similar studies in linguistics and the psychology of language. The difference comes, on our part, from the theoretical perspective of the dissertation, and, on the part of most other studies, from the dogma of the single mode - which now becomes the dogma of the single mode of utterance. Linguists generally construe material such as ours in the form

'S says that p; and his voice indicates that he is $\begin{bmatrix} \text{happy} \\ \text{annoyed} \\ \text{sad} \\ \text{etc} \end{bmatrix}$' (6)

In fact, research in this area will most likely come under a heading such as 'the emotional content of speech' (Lieberman, 1962). But, on the linguists' own evidence (never mentioned in this context) sentence-form (6) will have to be expanded to include more than emotions. In particular, it will have to cover the strange case of

'S says that p; and his tone indicates that he is saying that p' (7)

'Saying', that is, as opposed to 'doubting', 'asking', or even 'denying'. This leads to the conclusion adopted earlier concerning the relation of 'believes' to modes in general. Modes, whether in general or in the special case of speech acts, form a group and there is no obvious sense in which one is basic and the others derivative. The anomaly of (7) is removed by writing

'S utters 'P'; and his voice indicates that he ϕs that p' (8)

where 'utters' is non-mental (like 'vocalizes' or 'enuntiates the words') and the inferred mode ϕ may be 'says', 'is happy', 'orders', or any of those mentioned so far. The important point is that 'says' and its equivalents involve a modal inference no less than 'is happy' or 'is sad'.

The point has an important bearing on the selection of materials for studies on prosodic phenomena. From our perspective, a cryptic sentence such as 'On Sunday' has a lot of advantages, since its minimal syntax puts little or no constraint on the modal differentiation which can be achieved by intonation. The sentence can easily be uttered as a command, or an assertion or a question. This is not the case with more fully specified contents, since they will inevitably have syntactic features which make them more appropriate to one mode than another. It is impossible to say 'This is the third time he's been in to see me this week' or, 'There's that little black dog in the garden again' (Quirk and Crystal, 1969) as a command or a wish. It is even difficult to utter them as questions. Consequently, these authors (and others) are

studying prosodic phenomena with highly constrictive materials and the only modes which they are likely to find are sub-modes of the declarative mode. This is because it was assumed that declaration is basic to all speech acts, whereas in fact it is only one group of speech acts.

The oversight might have been corrected had there been any contact between linguistics and philosophy of language. For the concepts of 'illocutionary act' (Austin 1962) and 'speech act' (Searle, 1970) are close to the idea of a moded utterance and also have the effect of returning declarations to the family of speech-modes from which they have been estranged. As the philosophers point out, the correct usage of 'asserts', 'claims', 'declares' and 'says' (in this sense) no less than 'begs' or 'threatens', is sensitive to a variety of situational cues. These involve, for instance, the intention of the speaker to represent a state of affairs which he believes to be true and which is not already obvious. (C.f. Searle, 1970, p66).

The methodological problem in Studies 1 and 2 and the pilot studies which proceeded them, was to preserve as many of these cues as possible while holding content constant and allowing it to take on as wide a range of mode-values as possible. Intonational cues were selected to overcome the problem of shifting contents. An expression of minimal syntax was selected to allow the content the widest possible range of mode-values. While it is very likely, therefore, that mode-spaces based on different cues and contents with formally different contents will differ from that obtained here, it is unlikely that they will be

more general than it.

From now on, the factors CREDENCE, OPTION, SALIENCE, AROUSAL and WEAK BELIEF (and possible others) will be the referent of the expression 'intentional modes'. This is not to give any airs of finality to the two studies just reported, but merely to provide a more concrete context for the discussion to follow.

The next chapter will deal with the status of intentional modes in a theory of behavior.

Chapter 3. Intentional modes in psychological theory.

In an acceptable use of a sentence in the form

'S ϕs that p' (1)

the substitute for 'ϕ' is what we will call a 'mode-verb', and its referent is the mode of an actual mental state. A miniature theory of intentional modes has just been presented. It is a theory only in the sense of a tentative enumeration, and it says that mental states in general differ with respect to mode on five main dimensions: CREDENCE, OPTION, SALIENCE, AROUSAL and WEAK BELIEF. The question to be asked now is, what features of a behavior-system do mode-verbs refer to?

But there is a prior question, namely, what kind of system merits descriptions in form (1) in the first place. One answer is that all and only those Ss who have minds can have descriptions in form (1). For some, this is a defensible opening provided 'mind' is introduced not as a primitive term but as that still-to-be-defined property of S responsible for its descriptions in form (1); and provided further specifications are forthcoming. For others, the answer is the end of the road for 'mind' and its peculiar descriptions. They claim that sentences in form (1) can never be acceptable scientific statements; and that 'mind', by virtue of its association with them, can never be a scientific term.

The trouble with (1) is that it has the character of an indirect quotation. What is meant by 'indirect' here may be seen by contrasting

'S says (the sentence) 'p' ' (2)

with

'S says that p' (3)

By allowing the physiologist to define 'says' and the phonetician to specify the sentence 'P', (2) becomes as tight a description as one wishes. Not so with (3), since 'says' in this sense is contaminated with 'believes', 'intends' and the like. It is because of this that descriptions in form (2) are flexible about the exact words to be substituted for 'p'. As long as the words still capture the gist of what was meant, the sentence still counts as true. There is a price to be paid for this freedom, however, since the transition from (2) to (3) swells one's ontology from organisms and sounds to organisms, sounds and meanings or propositions.

What is bothersome about this is that meanings and propositions are hard to specify. The meaning of an expression 'P' seems to change from one context to the next, thus blurring its relationship with the more stable category of sentences.

> Commonly the degree of allowable deviation depends on why we are quoting. It is a question of what traits of the quoted speaker's remarks we want to make something of; those are the traits that must be kept straight if our indirect quotation is to count as true. (Quine, 1960, p128)

This, however, is only a symptom of the real problem. It seems that indirect quotation is more a matter of conjecture than description no matter how the standards are set.

> In indirect quotation we project ourselves into what, from his remarks and other indications, we imagine the speaker's state of mind to have been, and then say what, in our language, is natural and relevant for us in the state thus feigned. An indirect quotation we can usually expect to rate only as better or worse, more or less faithful, and we cannot even hope for a strict standard of more and less; what is involved is evaluation relative to special purposes of an essentially dramatic act. (Quine, 1960,p219)

If things are bad in the case of speech-acts, they are far worse with other mental acts. In the linguistic case there is always the original 'text' and, in principle, one can always go back and check the indirect versions against it. When it comes to fears, hopes, intentions and the like, not to mention the mental states of organisms which cannot speak for themselves, the text too is a product of artistic ability. It is a sentence which we find appropriate as we act out the state of mind imagined for our subject.

Quine's conclusion is that the production of sentences in form (1) 'contrasts strikingly with the spirit of science at its most representative'. Others have pointed out the same contrast in order to argue the limitations of 'science at its most representative' and the need for an autonomous 'science of the mental'. To Quine, all it demonstrates is the 'emptiness of a science of the intentional'

> If we are limning the true and ultimate structure of reality, the canonical scheme for us is the austere scheme that knows no quotation but direct quotation and no propositional attitudes but only the physical constitution and behavior of organisms. (Quine, 1960, p221)

This is the essence of Quine's long-standing objection to minds and meanings in science. It is important not just because of Quine's stature, but also because it is implicit in many behaviorist critiques of mentalism.

In the context of our own theoretical position, the issue about direct vs indirect quotation can be better appreciated by comparing

'John says (the sentence) 'This is coffee' ' (4)

and

'John says that this is coffee.' (5)

Sentence (4) simply attributes a response to a subject. It is like saying, 'Rat #44 pressed the bar'. In particular, it does nothing to determine whether John was asking us or telling us about the coffee, having doubts about it, or even hinting that he didn't like it very much. Or whether he was doing none of these and merely practising his English. Whatever we make of these additional interpretations, it seems that there is one of them in (5) since it makes it clear that John is telling us about the coffee, not asking us, or disapproving of it, or anything else. On the other hand, whether John actually said,'This is coffee', or 'Here's the coffee', or merely nodded in the direction of the pot is now undetermined, since (5) is compatible with any of these.

Our problem is to acknowledge the indeterminacy in all indirect quotation without having to admit that description has been abandoned in favor of fantasy. To do this, it is first necessary to assume that descriptions in the form 'S øs that p' refer to features of S which are 'deeper', 'more molar', etc. than anything suggested by the wording substituted for 'p'. If one can then show what these features might be and how, even in principle, they could be described directly, then form (1) becomes, at worst, a harmless paraphrase.

But it is not easy to envisage features of a system which will support the predication of modes and contents while also having a complete description in non-mental terms. Consider the problem facing a theoretical neurologist if he should try to explain mental contents in terms of the arousal of such and such neural pathways.

> We can, to be sure, record the response of a single cortical cell which ... has been found to correlate with the presentation of a specific stimulus-class - e.g. frequency of auditory tone rising. But we cannot give a neurophysiological identification or description of the cerebral cells characteristically active ... when someone sees, thinks of, fears or searches for a purple cat ... (Boden, 1970, p206)

Instead, what the neurologist will do is 'postulate such models on behavioral grounds and hypothesize that they correspond to actual neurophysiological mechanisms' (Boden, 1970).

In this respect, the behavior theorist should have been in a much stronger position, since his constructs are already of the variety which draw mostly on behavioral evidence and make little or no commitment to one physiological mechanism rather than another. But in practice he has been hamstrung by his reluctance to give these constructs the sort of internal structure which they must have if they are to cope with the 'compositional complexity' of mental states, i.e. the structure reflected in the syntax of substitutions for 'p' in sentences of form (1). (C.f. Rozeboom, 1972, p37)

In the meantime, mental structure became the speciality of psycholinguistics and computer simulation. Precise descriptions of primitive

behavior systems became available and provided the incentive for asking, 'How complicated does a system have to be before it can be described in mental terms?' Or, What kind of systems can have modes and contents? Following Boden (1970) this question will be approached with the help of an imaginary robot, equipped with a fully integrated battery of perceptual, problem-solving and linguistic abilities such that it is able to distinguish between the elements in a simple environment of, say, big and small blocks, pyramids and cubes,and to perform simple operations on them. Now if responding, verbal and otherwise, is indeed cued to features of the environment (the big block, the small pyramid), then there is no need to know anything about the program, much less the circuitry, in order to make the claim that they involve a representation of these features. Here, the term 'representation' has no overtones of mental imagery or internal pictures. It is a functional description of that portion of the machine's interior which makes it respond to one feature in the environment to the exclusion of likely competitors.

Indeed, if one is interested in behavior as opposed to machine-construction, a micro-description of a particular representation is beside the point. Usually the same control system could be programmed and implemented in any number of ways. Thus a description of hardware will fail as a description of a control system, since it gives no clue as to the alternative mechanisms which would produce the same end result. It fails to do this because the most relevant features of a control system are, in a sense, not in the machine at all but outside it, in the environment. It is not the internal mechanics of a state which most appropriately describe its function in a control system, but the environmental

feature which it can be said to be about. This feature is the object of that portion of the system, and the corresponding content is whatever features of the machine make this relation possible.

It is when mechanisms are described in terms of their contents that descriptions in form (1) arise. If we wish to say that the system has a concept of 'block' (as opposed to'pyramid' or 'cube') the least we mean is that it can perform operations describable as

$$\text{'S} \begin{bmatrix} \text{judges} \\ \text{believes} \\ \text{infers} \\ \text{etc} \end{bmatrix} \quad \text{that X is an instance of 'block'} \qquad (6)$$

This is a description with all the undesireable characteristics pointed out above. Now, however, they can be traced to entirely unremarkable features of a behavior system and our limited concern with describing them in detail every time we refer to them. Sentence (6) has referential opacity because it is, in part, a report on the feature detectors which control the machines discriminations, and not every term co-extensive with 'block' will accurately represent these. Again, one cannot quantify into

'S is searching for a block' (7)

in the usual manner. The reason is easy to find, however. 'Block' again serves to denote the detectors controlling the search. It denotes a content and the existence of a corresponding object is not implied.

At the same time there is a problem about the selection of the terms

'block', 'pyramid', 'cube', and so on. What is the justification for choosing these terms rather than, say, 'object classes 1, 2 and 3'? This is the source of the indirectness discussed earlier. The best one can do is to select a term suitable for one's own purposes in describing S's operations and which, at the same time, does not misrepresent the discriminations being used during these operations. 'Block' will be acceptable if the alternatives are what we would call 'pyramids' and 'cubes' and if the features used to detect them are roughly those we use ourselves in deciding whether something is appropriately called a 'block' or not. 'Box' would probably be acceptable too; but the indeterminacy here is of no consequence provided one can furnish, when necessary, the details of the discriminatory process.

Representations in general, therefore, are inferred from behavior, and their specific content is assigned to them as part of the same inference. However, not every consistent pairing of a response class with a stimulus class warrants the inference. One is reluctant to say that the computer 'remembers' or 'knows' everything that it reliably outputs on cue. Frijda (1972) mentions 'flexibility of retrieval' as one of the conditions for genuine remembering. Similarly, Wilson (1972) reserves the term 'knowledge' for 'information which is stored in a form which permits retrieval in a variety of different contexts'. This is another way of stressing the essential indirectness of intentional verbs. 'Knows' and 'remembers' are inappropriate if they are not followed by a genuinely indirect quotation with the inherent flexibility spoken about above. They ought not to be used for states adequately describable by direct quotation.

The same point is often made by distinguishing between two senses of the term 'information'. Roughly put, there is a difference between the information which is in a system for the system's user and the information which is for the system itself. It is only in the latter case that the system warrants fully mental descriptions. Now, however, the concept of 'using information' has been introduced, which leads to the conclusion that the concept of 'information' in its fully mental sense is closely related to the concept of 'need' or 'goal'. As Dennett (1969, p46) puts it, 'for information to be <u>for</u> a system, the system must have some <u>use</u> for it, and hence the system must have needs'.

The same conclusion can be reached by questioning the adequacy of behavioral evidence, on its own, to determine a systems contents. For the behavior will be evidence for various contents as the assumptions about the systems prior needs are shifted around.

> A man's standing under a tree is a behavioral indicator of his belief that it is raining, but only on the assumption that he desires to stay dry, and if we then look for the evidence that he wants to stay dry, his standing under the tree will do, but only on the assumption that he believes the tree will shelter him; if we ask him if he believes the tree will shelter him, his positive response is confirming evidence only on the assumption that he desires to tell us the truth, and so forth ad infinitum. (Dennett, 1971, p103)

It turns out therefore, that if contents cannot be assigned subject to the qualification that some are <u>wants</u> and some are <u>beliefs</u>, then contents cannot be assigned at all.

This qualification on contents is what we have been calling their mode.

From the point of view of naive mentalism, which takes modes to be 'givens' of introspection, it is most unexpected that they should appear at such theoretical heights in a theory of behavior, namely as prior conditions to the assignment of contents. For naive mentalism, modes are simply 'ways of feeling' about something, to be attributed of oneself by introspective observation, and of others by modest inductions of the same order as inductions about intelligence or good humor. On the present analysis, the attribution of modes is determined by observations (internal and external) only through the mediation of an elaborate network of theoretical assumptions, many of them so remote from the possibility of empirical confirmation or disconfirmation that they must be part of the 'a priori content of naive psychology' (Heider, 1958, p130)

What Heider meant by this expression may be illustrated by his own example, the belief that people have that 'wanting that p'and 'p'lead inevitably to 'enjoying (the fact that) p' (Heider, 1958, p129). For, the contrary evidence (which is plentiful) is always diverted away from the implication to its components. Instinctively one explains the counter-examples away by saying that the want was no longer present when 'p' was realized, or that the realization wasn't up to expectations, or that the person in question probably didn't know exactly what he wanted in the first place, and so on. Yet the plausibility of these explanations derives, not from any facts but because they are in support of the original, a priori, implication. The implication, therefore, survives all contrary evidence because it is already written into the definitions of 'wants' and 'enjoys'. 'The connection between wish-

fulfilment and pleasure belongs to the a priori content of naive psychology and cannot be contradicted by experience ... (Heider, 1958, p130). When it seems to be contradicted, 'the perception of the events changes, not the relation' (p113).

There are many other reasons for doubting that modal predications have the observational support that common sense assumes. Even in the case of emotional modes, it has long been established that there are no 'plain facts' of internal arousal which will determine the mode's identity and content by a simple act of observation. (C.f. Schacter, 1964). With less intense modes, and in particular with the cognitive modes, a theory of internal observation becomes most implausible. One has only to read, for instance, Hume's attempted distinction between beliefs and fantasies in terms of 'solidity', 'vividness', 'firmness' and the like, to suspect that the entire enterprise is mistaken in its assumptions. (Hume 1738, p99ff). Much less can differences in the strength of beliefs be traced to an internal sense. More likely they are, as Newman (1870) claimed, the projections inward of social norms about the acceptability of different kinds of evidence.

Along the same lines, contemporary philosophers have argued that 'belief is a mode of consciousness which may be picked out only in terms of that which may be true or false', which in turn can only be identified by 'publicly intelligible standards of evidence and an actual tendency to use them' (Griffiths, 1967, p186). Thus, if we wish to determine whether we really believe something, and how strongly, the operations we go

through seem to have more to do with public standards of credibility than with internal perceptions. It is of interest to note that the most important psychological research on belief-strengths has a similarly normative approach. 'Subjective probability' is most frequently a theoretical quantity inferred from betting behavior and a model of rational decision-making. (C.f. Edwards, 1954). Unlike Newman, who would have considered such inferences a contamination of the belief-mode, Griffiths and others assume that they are part of its normal functioning. Just as Schacter (1964) suggests that beliefs about how one might be, or ought to be feeling are important determinants of how one does feel, so are the values of a content on the belief-mode determined by a complex of other mental acts, such as one's willingness to act on the belief, or one's confidence of being able to defend it.

If the predication of modes is complex, it is to be expected that the referent of modes in the behavior system itself is also elusive. For instance, to call them 'states of arousal' would be, again, to underestimate the compositional complexity of the moded content. In the case of beliefs and their varying strengths, Brentano facetiously argued that interpreting belief-strengths as degrees of arousal would lead one to predict brain-damage among mathematicians from overexposure to certainties (Brentano, 1889, p56). The common sense interpretation of modes as 'moods' or 'feelings' is no better off. It has a vague plausibility for the dimensions of INTEREST and AROUSAL; for the others, it fails to acknowledge the system of internal controls operating between modes and contents which makes a shift in a content's mode-vector quite unlike a 'change of mood'.

The conclusion of this section, therefore, is that modes are theoretical constructs in the nomological net of a behavior theory. The logic of the concept shows that it is high up in the theoretical reaches of the net, with the result that it is unlikely, and unnecessary, that it should have any identification with the contents of naive introspection or the mechanisms of physiology or learning theory.

Having derived a description of intentional modes from the modal predications of naive mentalism, and clarified the nature of the concept itself, the next chapter will rederive some of the empirical implications of intentional modes on the topic of attitudes.

Chapter 4. Intentional modes and attitude theory.

One sense of the term 'attitude' is easily introduced, since the philosophers' expression 'propositional attitude' is synonomous with our 'intentional mode'. In this sense of the term, attitudes <u>are</u> modes. This is a very general sense of 'attitude', however, with a restricted use even in philosophy. It is usually encountered in the course of an admission that affirmations, negations and predications belong in the same group as fears, hopes and wishes as far as linguistic oddities and philosophic suppositions are concerned. The idea behind the expression, therefore, is that affirming and denying involve definite 'ways of attending to' or 'ways of feeling about' the world. And the name given to all such attendings and feelings is 'propositional attitudes'.

If the term 'attitude' is restricted to ways of attending which are somehow 'evaluative', one comes closer to the usage of psychology and common sense. In this sense of the term, there is a sharp contrast between attitudes, on the one hand, and the non-evaluative modes on the other. 'Evaluation' is being used here in a loose, intuitive sense. In the present discussion it will be defined to mean any mental state with non-zero loadings on the dimensions of OPTION and/or SALIENCE. In other words, any mental state describable in the form

$$\text{'S} \begin{bmatrix} \text{hopes} \\ \text{recommends} \\ \text{is glad} \\ \text{is concerned} \\ \text{etc.} \end{bmatrix} \text{that p.'} \qquad (1)$$

where the mode-verb has a high loading on either OPTION or SALIENCE or both. (Since 'is glad' has substantial loadings on both dimensions, it will be taken as representative of this group from now on.)

While (1) makes a suitable definition for attitudes and evaluations within the framework of this dissertation, the more usual practice in attitude theory is to define 'attitude' as this plus everything else which is either influenced by or predictive of the values it takes for a given content. This in turn leads to to discussions on the 'components of attitude' (to which we now turn) in which 'attitude' as we have defined the term, is either broken down into lesser entities or else alleged to be only one part of 'attitude' in some broader sense.

Parenthetically, the analysis of contents belongs in principle in psycho-semantics and has become part of attitude-theory only because of an empirical relationship. This is the fact that content-patterns in the belief-mode may be peculiar to that content's loading on the attitudinal dimensions. For instance, Abelson (1967) showed that a set of propositions on Disarmament yielded distinctive synonomy-spaces depending on whether the semantic judgments were made by subjects who were opposed to the idea or subjects who were in favor of it. It is very likely, too, that the inductive and deductive rules by which content is expanded are distinctive for contents of high valuation.

'Hot' cognition (Abelson, 1958, 1963) follows its own variety of ' 'psycho-logic'. Special cases of these phenomena, such as the dependence of beliefs about people on like or dislike for them, are well-known to common sense and constitute centraltopics in person perception and the study of prejudice and stereotypes.

In studies of this sort, however, content is analysed (at least implicitly) as a function of its entertainment on the evaluative dimensions. But content-analysis in general has no such slant and, consequently, no relevance for attitude theory. If it turns out, for example, that in a random population, positions on the Negro question decompose into positions on Gradualism and Integration (Woodmansee and Cook, 1967) the latter are clearly components of the topic, not of its entertainment. Yet factors of this sort are often presented as if they bore on distinction such as the classic one between cognitive, affective and behavioral components of attitude.

It is easy to show that this durable distinction is not concerned primarily with differentiation within the attitude-topic but rather with differentiation in the modes of the topic's entertainment. This will become obvious later in the discussion. For the present, let the affective component be identified with mental states in form (1), and let the cognitive component be identified with mental states in the form

$$\text{'S} \begin{bmatrix} \text{is sure} \\ \text{believes} \\ \text{knows} \\ \text{etc} \end{bmatrix} \quad \text{that p'} \qquad (2)$$

where the mode-verbs are drawn from the CREDENCE dimension. This leaves

as the most obvious candidate for conjoined affective and cognitive components, mental states in the form

'S believes and is glad that p'. (3).

And while this is not what is usually meant when there is talk of affective and cognitive components, an important class of studies in attitude theory is concerned with conjunct modes of precisely this form. 'Wishful thinking' as studied by McGuire (1960a, 1960b) refers to a positive correlation between the modes in mental states in form (2). Jones and Davis (1955) are dealing with the same category of mental acts when they arrange for an experimental group to be annoyed by what they witness and find that the beliefs they form are different as a result of the annoyance. And the presence of a conjunct mode in form (2) is assumed in Fishbein and Raven's(1962) distinction between the A and B scales.

In spite of all this, however, discussions of cognitive and affective components are more often concerned with the situation describable as

'S believes that X is A, B, C, ... and $\begin{bmatrix}\text{good}\\\text{bad}\end{bmatrix}$' (4)

The act of believing is usually recorded in a rating of some sort. Since a belief that something is good or bad is still, on the face of it, a belief, it is surprising to find a concensus that mental states in the form

'S believes that X is $\begin{bmatrix}\text{good}\\\text{bad}\end{bmatrix}$' (5)

are somehow not beliefs at all but something else, variously called

evaluations, evaluative beliefs, or simply attitudes. To my knowledge, only Wyer and Goldberg (1970, p102) have objected to this practice.

> ... the attribute statement 'Negroes are bad' concerns the relationship between members of the two categories 'Negro' and 'bad'. The liklihood that the relationship exists may vary in much the same manner as the likelihood of the statement 'Negroes are intelligent' or 'Negroes are supporters of civil rights'. While the dynamics underlying change in these types of statements may conceivably differ empirically, there is no a priori reason to assume that this is the case.

In practice, little harm is done by this reclassification of beliefs in form (5) since it is a sound empirical assumption that they will be accompanied by mental states in the form

'S is glad that X is A, B, C, ... ' (6)

or,

'S $\begin{bmatrix}\text{likes}\\ \text{dislikes}\end{bmatrix}$ X' (7)

both of which are justifiably treated as different from beliefs.

There is an important difference between (6) and (7). Form (6) is fully mental and implies that the state so described has the same internal structure as a belief to the same effect, namely the proposition p. Form (7), on the other hand, has a plausible paraphrase

'S reacts to X with a like/dislike reaction of strength __' (8)

which is a non-mental description. Thus it, in turn has possible paraphrases in which the 'like/dislike reaction' may be eliminated in favor of a mediation response, or an autonomic reaction or even with an association of the type that verbal learning theory deals with.

In my opinion, such identifications are not acceptable. No doubt descriptions in form (8) are appropriate to a large class of phenomena including many non-rational tastes and, more obviously still, pathological attachments and aversions. It is in these cases only that the paraphrase from (6) to (8) is plausible; and the explanation of the state itself in terms of the mechanisms just mentioned is also plausible for these cases. But these are not the phenomena which the attitude theorist wishes to explain. If there is any attitude typical of those studied in attitude research it is the political opinion, which is certainly not <u>just</u> a response cued to the presence of some politician or his picture or his name, but an articulate like or dislike for what he is and does. In other words, the political opinion is a mental state presupposing just as rich a semantic system as do beliefs about the politician in question, and related to the latter in some complicated and sensitive fashion.

However, the ideas implicit in the general thrust of attitude theory are often denied in its explicit statements. Our example here will be the well-developed theory of Fishbein (1963, 1967a, 1967b) in which attitude is treated as an affective response conditioned to single terms and transferred to others via beliefs that one is true of the other. More precisely, if a_i is the affective response conditioned to predicate i, and b_i is the strength with which i is believed to be true of object o, then attitude towards o (A_o) is given by $\Sigma a_i b_i$.

In spite of impressive empirical support, this account of attitude-

seems highly unlikely from the perspective of this dissertation. What is most unlikely about it is the claim that affective responses to single terms and their referents play an important part in the formation of attitudes of the variety studied by Fishbein (e.g. racial and political opinions, like and dislike for people, opinions on 'hot' topics, and the like). It will be claimed here that, on the contrary, attitudes like these grow, for the most part,by our being successively annoyed or pleased that the attitude object is or does such and such. The unit of attitude is not a reaction to a stimulus but a propositional content moded on the OPTION and SALIENCE dimensions. Not only is this closer to the intuitions of naive mentalism, it is also the way many social psychologists think about attitude-formation in practice. To take only two examples, the 'sequential evaluations' which are known to effect terminal judgments of attractiveness (Mettee, 1971, Aronson and Linder, 1965) and the 'perceived valences' of Rosenberg's theory (Rosenberg, 1965) are introduced as fully propositional evaluations (in form (1)) and it would take a very far-fetched account to construe them otherwise. In other words, they are options for or against a certain state of affairs, not reactions to a stimulus.

Why, then, has Fishbein been able to predict A_o from $\Sigma a_i b_i$ if the a_i really play no important part in the formation of A_o ? The answer, I believe, is that while the a_i as theoretically described are irrelevant in attitude-formation, the quantities substituted for them in Fishbein's research are highly relevant. For the 'operational definition' of a_i is the loading of the predicate i on the Evaluative dimension of the Seman-

tic Differential, which records much more than the 'associations' or 'affective mediation responses' which its inventors modestly claim for it (Osgood, Suci and Tannenbaum, 1957, ch. 1). This will be discussed in detail in the second part of this chapter. Here it is necessary to anticipate oneof the conclusions of this discussion, which is that the Evaluative scales of the Semantic Differential record beliefs. They are, moreover, beliefs in form (5) above ('S believes that X is good/bad') and are therefore closely related empirically to mental states in form (6) ('S is glad that X is A, B, C ...') which are attitudes towards X, on our interpretation. It is these latter elementary, propositional evaluations which are most closely related to the global like or dislike reflected in the measure of A_0 taken, again, from the E dimension of the Semantic Differential.

Study 3 was designed to test this empirically. The rationale was as follows. If an attitude object, o, is specified by a set of properties, the overall attractiveness of o, A_0 , may be immediately analysed into the propositional evaluations of the fact that o has these properties. In fact, in this situation, A_0 itself, as measured on a like/dislike scale, or a good/bad scale should be nothing more than a summary, or composite of such evaluations. On the other hand, beliefs that the properties themselves are good or bad are related to A_0 in a less direct fashion and, most likely, through the mediation of the propositional evaluations just mentioned. This is represented in Figure 7, and if itis correct then A_0 should correlate more highly with the summed propositional evaluations(ΣPE_i) than with $\Sigma a_i b_i$.

S believes that o is i, and that i is good/bad. (b_i, a_i)

↓

S is/is not glad that o is i. (PE_i)

↓

S likes/dislikes o. (A_o)

Figure 7. Schematic representation of attitude-formation.

Study 3.

Fifty Ss completed a series of ratings, all on 7-point scales (for further details, see appendix 4.) First they rated 12 predicate-terms on good/bad scales. The terms were, WEARS GLASSES, GOING BALD, HEALTHY, FRENCH-SPEAKING, WITTY, ARROGANT, FLASHY DRESSER, INTELLIGENT, MARRIED, ATHLETIC, GOOD-LOOKING, MIDDLE-AGED. Responses were scored from +3 to -3, and the sum of these scores across predicates was the first variable, Σa_i . for each S.

Next, they rated how bothered/glad they would be to find that their prospective STUDY-PARTNER for a semester was each of these things. These responses were also scored from +3 to -3 and summed to give ΣPE_i . The third variable was liking for the STUDY-PARTNER (A_{sp}) and this was recorded on a single scale. The expectation was that A_{sp} would be better predicted from ΣPE_i than from $\Sigma a_i b_i$ (which is equal to Σa_i in the

present case since belief-strength is unity for all predicates, i.e. Ss were instructed to take all predications as completely true.)

The second half of the experiment was designed to involve differential belief-strengths. Ss rated how true or false it was that the Prime Minister, PIERRE TRUDEAU was each of the things named by the predicates. This scale provides the weights, b_i , used to compute the fourth variable, $\Sigma a_i b_i$. Since, however, there is little agreement in the literature (c.f. Hackman and Anderson, 1968, p64) whether the lower half of a belief-scale indicates weak belief or disbelief, two sets of weights were computed. In the first the 7-point scale was scored from +3 to -3; in the second it was scored from 1.00 thru .8 .6 .5 .4 .2 to 0.0 . (For computational simplicity, the latter scale deviates slightly from linearity with the original). The two weighted sums are called, respectively, $\Sigma a_i b1_i$ and $\Sigma a_i b2_i$.

As in the case of the STUDY-PARTNER, the PE_i are obtained by having Ss rate how bothered/glad they are that TRUDEAU is, or is not, these things. The ratings are then summed to give ΣPE_i.

The final variable is like or dislike for TRUDEAU, A_t , and is obtained from a single scale, scored from +3 to -3. Again, the expectation is that this variable will correlate more highly with ΣPE_i than with either $\Sigma a_i b1_i$ or $\Sigma a_i b2_i$.

The results are presented in Table 5.

	Σa_i	$\Sigma a_i b1_i$	$\Sigma a_i b2_i$	ΣPE_i
A_{sp}	.27			.46
A_t		.52	.36	.71

Table 5. Correlations between A_{sp} and A_t and prior measures.

Discussion.

The results presented in Table 5 are in agreement with prior expectations. Both measures of attitude are more highly correlated with ΣPE_i than with $\Sigma a_i b_i$. Intuitively, one might expect this, since the PE_i ratings are made 'in the context of' a STUDY PARTNER and TRUDEAU whereas the a_i ratings are made on the 12 properties before there is any indication whose properties they are. The results might, therefore, be attributed to a 'context effect'. In the following discussion, several senses of 'context' which can be applied to the present results will be elaborated, in the belief that some clarification of the idea can be achieved, and that far from being a 'nuisance variable', it is a central concept in any account of mental phenomena. So much so that a theory of attitude-formation which cannot absorb the more obvious senses of the term may well be fundamentally mistaken about the nature of the elements entering into the process.

Specifically, Fishbein thinks of these elements as units of affect (a_i)

cued to a stimulus-group representable by the name to be substituted for 'X' in descriptions of the form, 'S likes/dislikes X'. The belief-system (always fully propositional in Fishbein) is then thought of as a mechanism which transfers to a given concept the affect-units of all those believed true of it, weighting each by the strength of the belief. The 'context' of attitude formation may first of all be thought of as the beliefs active in the process, and in this sense it is adequately taken account of in Fishbein's equation. In the first part of the study Ss were told to take the descriptions of the STUDY PARTNER as complete and accurate; in the second part, actual belief-strengths were recorded and incorporated into the predictive equation. One cannot do any more than this to accomodate 'context' in this sense. The results in Table 5, however, show that the prediction of A_o from $\Sigma a_i b_i$ is lower than from ΣPE_i . Evidently the latter quantity is sensitive to still further senses of context.

Another interpretation of 'context' is in terms of 'salience'. The vulnerability of Fishbein's theory in this respect may be seen in the following example. Suppose one describes six different study-partners with a view to predicting liking between them from $\Sigma a_i b_i$ and ΣPE_i. Since there are many predicates (such as BREATHES, or WILL DIE) which have extreme scores on a simple good/bad scale without being 'salient' to the topic of study-partners, the descriptions can be arranged to make $\Sigma a_i b_i$ arbitrarily large or small without changing the likeableness of the person so described. Of course, many of the descriptions are now 'irrelevant' or 'non-salient'. Nevertheless, the point has been made

that Fishbein's $A_o = \Sigma a_i b_i$ is plausible only if the relevance and salience of the a_i are matched for attitude-objects. Fishbein does this in various ways, for instance by getting Ss to select the six best descriptions of an attitude-object (Fishbein, 1963); but nothing within the theory itself is sensitive to salience. In the prediction of liking between study partners, it is very likely that ΣPE_i would be relatively invulnerable to non-salient descriptions, since a bothered/glad scale should adjust itself appropriately. This is not to say that any great light would thereby be shed on the question of salience. But at the very least, the phenomenon would have a representation within the terms of the theory.

In the data for the present study, salience may be identified with whatever is represented by the regression coefficients in the multiple regression of A_o upon predicates. These are presented in the columns of Table 6, together with the associated multiple correlations. The latter cannot be any lower than the previously reported simple correlations between A_o and the sums Σa_i , $\Sigma a_i b1_i$, $\Sigma a_i b2_i$, since the simple correlation with a sum may be taken as a multiple correlation in the special case where the coefficients are all set at unity. The multiple correlation between A_{sp} and a_i is .68, which is a substantial increase over the simple correlation of .27, and also over the correlation of .46 between A_{sp} and ΣPE_i. The multiple correlation of A_t with $\Sigma a_i b1_i$ and $\Sigma a_i b2_i$ show similar increases over the corresponding simple correlations (.52 to .72 and .36 to .66). However this is no improvement on the simple correlation of .71 between A_t and ΣPE_i. This supports the claim made above that propositional evaluations

Regression of	A_{sp} on a_i	A_t a_ib1_i	A_t a_ib2_i	
WEARS GLASSES	.19	.06	-.077	
GOING BALD	-.32	-.11	-.070	b-coefficients
HEALTHY	-.38	.05	-.012	
FRENCH SPEAKING	.47	.03	-.058	
WITTY	.48	.19	.032	
ARROGANT	.10	.07	.012	
FLASHY DRESSER	.06	.10	.032	
INTELLIGENT	.30	.12	.045	
MARRIED	.28	-.03	-.012	
ATHLETIC	.17	-.21	-.078	
GOOD LOOKING	-.57	.15	.005	
MIDDLE AGED	-.03	.11	.048	
	.68	.72	.66	R

Table 6. Regression coefficients and multiple correlations for the regression of A_{sp} on a_i, and A_t on a_ib1_i and a_ib2_i.

absorb part of what is meant by 'salience'.

A final explication of the notion of 'context' is implied in the possible objection that the good/bad ratings should have been made 'in the context of' prospective study partners and Prime Ministers respectively. In other words, Ss should have been asked to rate STUDY PARTNER WHO WEARS GLASSES, STUDY PARTNER WHO IS GOING BALD, and so on. But this objection cannot be sustained without making the same point that this study was designed to make. It will not do to talk about 'composite stimuli' if something less than propositions is meant; and it will not do to talk about affective responses 'associated with' the entertainment of these propositions if something less than the manner or mode of entertainment is meant. In this form the objection becomes the same as our main point: that the immediate

constituents of attitude are mental states in the form 'S is/is not glad that p'.

The question of the relation between good/bad scales and propositional evaluations was touched on briefly above. It was suggested that there is at least a strong empirical relationship between mental states in the form 'S believes that X is good/bad' and those in the form 'S is/is not glad that X is A, B, C ... '. In other words, people are generally able to follow up claims that something is good or bad with claims about the things that are good or bad about it. The remaining section of this chapter will be concerned specifically with this relationship and its bearing on actual behavior for or against the attitude object. The main point to be made is that attitudinal behavior, like expressions of like or dislike, are most closely related to propositional evaluations of the attitude object, and that other moded contents influence behavior only through the mediation of propositional evaluations. Thus while any mental state has potential for influencing behavior, it may not be able to do so without generating propositional evaluations. Among beliefs, it has just been claimed that those in the form 'X is good/bad' are expecially germane to such evaluations, so much so that it may be the case that other beliefs can yield evaluations only through the mediation of good/bad predications. This is the situation outlined in Figure 8. It is in conflict with a claim made in Osgood et al (1957, p198) that beliefs in the forms 'X is active/passive' and 'X is powerful/weak' control behavior independently of beliefs that X is good/bad. In order to explore this

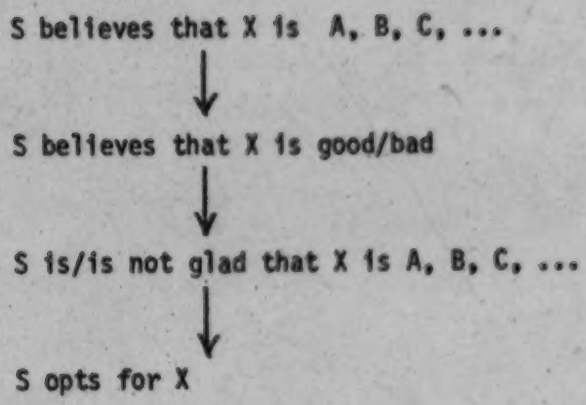

Figure 8. Schematic representation of attitudinal behavior.

conflict, however, it is necessary first to review the theoretical implications of the Semantic Differential itself. In the following paragraphs it will be argued (1) that the Semantic Differential (SD) deals exclusively with beliefs, (2) that E, P and A have to be interpreted primarily as dimensions of content within the belief-mode, (3) that they have nonetheless been interpreted as dimensions of mode-space and as non-mental mediation responses, and (4) that while this has some plausibility for the E dimension, it has none for P and A.

(1) The occurence of mode-free terms like 'meaning' and 'connotation'. non-mental terms like 'association' and 'mediation response', and a variety of terms suggesting 'affective' and 'emotional' modes - all of this obscures the fact that the SD deals with mental states in the belief-mode only. These are the S's answers to questions such as, 'Is X hard or soft?', 'Is X big or small', and so on. The instructions make it clear that S is expected to make only those predications which he believes to

be true, as opposed to those he finds amusing, or dreadful, or interesting or whatever. Where there is no defensible sense in which he can assert that X is hard or soft, big or small, he is supposed to mark the neutral spot. Ideally, there should be as few as possible of such 'irrelevant' scales (Osgood et al. 1957, p78)

(2) From this it follows that the least controversial interpretation of E, P and A is as three categories into which people tend to put things in their descriptions of the world. Osgood (1969) says that this is exactly what he intends by E, P and A, and that his use of the term 'affective' to qualify the dimensions was merely to suggest that Goodness, Activity and Potency are somehow 'affect-like' properties of things. It was not intended to imply that there was something affective about the manner of apprehending these properties. In other words, he takes the invariance of E, P and A to indicate that people have a tendency 'to represent the good versus the bad implications of things, the strong versus the weak of things, and the quick versus the slow of things' (Osgood, 1969).

(3) But in other contexts, E, P and A have at least two prominent interpretations along different lines, (a) as mode-like properties of mental states, and (b) as non-mental mediation variables.

(a) Osgood (1969) has high praise for Kuusinen's (1969) description of E, P and A as 'affective filters' which somehow 'recode' the contents of the more'objective' or 'affect-free' belief dimension. This suggests a single basic content undergoing certain transformations according as it is processed differently; and whether or not

the 'filters' are to be equated with our 'modes of entertainment', they are certainly more than just expansions of content.

(b) An ongoing concern of Osgood's is to provide a theory of intentionality itself. He wants to show how, in the terms of learning t theory, an encounter between a subject and a sign of X can be about X, or, have X as its content. His answer is that the encounter is about X if it consists in the production (via the sign) of distinctive fractions of an encounter with X itself. The sign is about X by mediating the process. Osgood usually skips the details about these fractional responses - what they are, how the distinctive ones are selected, what principles of redintegration might operate, and so on. One suggestion he makes, however, is that the multiple r_m contains E, P and A responses among others, typically ocurring with different patterns of intensity. What these intensities are for a given S and a given sign can be inferred from his factor scores for that sign on the SD.

The interpretation of E, P and A as 'filters' will not be pursued here any further since it is more a metaphor than a precise statement. The non-mental interpretation of E, P and A raises interesting points however. It is clear that E, P and A as components of a mediation response are indeed non-mental, since to construe them otherwise would make the surrounding theory of intentionality vacuous. It is at least the beginnings of a theory of aboutness to say that a response is about X if it is derived in such and such a fashion from responses to X. There is no contribution at all to an understanding of aboutness in saying that a

response is about X if it is a belief about it or a concept of it. In this context, therefore, E, P and A are neither contents nor modes nor moded contents but mediation responses in the learning theory tradition, proposed as a partial explanation of the very idea of 'content' itself. At the same time, the existence of such non-mental responses, and their intensities, are indirectly revealed in the avowedly mental ratings of the SD.

A problem arises with respect to the prediction of behavior from the SD. If one thinks in terms of a multiple mediation response, then the more of its components that are known, the better the mediated behavior can be predicted. This is what Osgood has in mind when he contrasts 'meaning' and 'attitude'. By 'meaning' he means the total complex of internal responses cued to a given term; by 'attitude' he means the E response only. He then claims that the prediction of behavior is better done from 'meanings' than from 'attitudes'.

> ... the attitudinal disposition itself accounts for only part of the intervening state which mediates between situations and behaviors, albeit perhaps the dominant part. The meaning of NEGRO to the individual subject is richer by far than what is revealed by his attitude score. Within the framework of the theoretical model underlying our own research, attitude is one - but only one - of the dimensions of meaning, and hence provides only part of the information necessary for predictions. (Osgood et al. 1957, p198)

In support of this, he cites a study in which ratings on the Bogardus Social Distance Scale were regressed on the E. P and A scores for the same attitude objects, with the result that multiple correlations increased considerably (e.g. from .22 to .78) when P and A scores were added to E scores in the regression equation.

What is plausible about this claim is the idea that every component in a mediation response should control the resultant behavior to some extent. It is when values are assigned to three such components from SD data that the argument runs into trouble and the isomorphism between the E, P and A of mediation theory and the E, P and A of the SD breaks down. The reason is that in the fully mental ratings of the SD, the very meaning of 'good' and 'bad' makesit likely that this scale will pick up, not just most of the influence of mental states on behavior but all of it. Thus when the size or weight or whatever of a certain o object are important considerations in our behavior for or against it, these properties also come under the categories of 'good' and 'bad'. This is because of the a priori meaning of 'good' and 'bad' in ordinary usage, which allows the terms to refer to any property of an object that disposes us favorably or unfavorably towards it. It this is the case, then by definition of the good/bad scale, all potential for influencing behavior will have been partialled out of the P and A dimensions and lodged exclusively in the E component. This makes it impossible to substitute E, P and A scores as values of the theoretical mediation responses of the same names, since by definition these act as relatively independent elements and control behavior jointly.

Thus, while any predication may influence behavior, it will be synonomous with 'good' or 'bad' in that context and will therefore load on the E dimension. Conversely, P and A will record only those senses of potency and activity which do not overlap with evaluation. This leads to the prediction that, contrary to the claim of Osgood et al. , adding P and A to E in the regression of attitudinal behavior on SD factors will not

increase the multiple correlation appreciably. This was the prediction which Study 4 was designed to test.

Study 4.

(See Appendix 5 also) Fifty Ss were told that they were taking part in a survey of student opinion about psychology experiments. They did abstracts from three different experiments, a memory-task with audio-visual presentation, a political attitudes questionnaire, and the experiment on attitude-formation just described above. As soon as they finished an experiment, they rated it on the following 13 scales:

active passive
soft hard
unpleasant pleasant
repetitive varied
powerful powerless
interesting boring
static dynamic
large small
good bad
slow fast
strong weak
meaningful meaningless
light heavy

These were selected from Osgood te al. (1957) to mark the dimensions E, P and A (4 scales each) while being as germane as possible to the topic of experiments. The repetitive/varied scale was added because of its apparent relevance.

After the third rating, Ss stated their first, second and third preference among the experiments. This was the first dependent measure. Then they were asked to do some more of the political attitudes questionnaire,

and then to rate it again - to give an estimate of the reliability of the scales, they were told. They were free to do as many of the 300 items as they wished and were assured that the data would be appreciated. The number of items completed voluntarily was the second dependent variable. The expectation is that in the regression of these two variables on the appropriate E, P and A scores, only E will have predictive power.

To obtain E, P and A scores for the three experiments, a separate factor analysis was done. For the purpose of correlating the scales, the ratings of the three experiments and the re-rating of experiment #2 were considered as replications. This gives a 13x50x4 matrix of ratings (Figure 9)

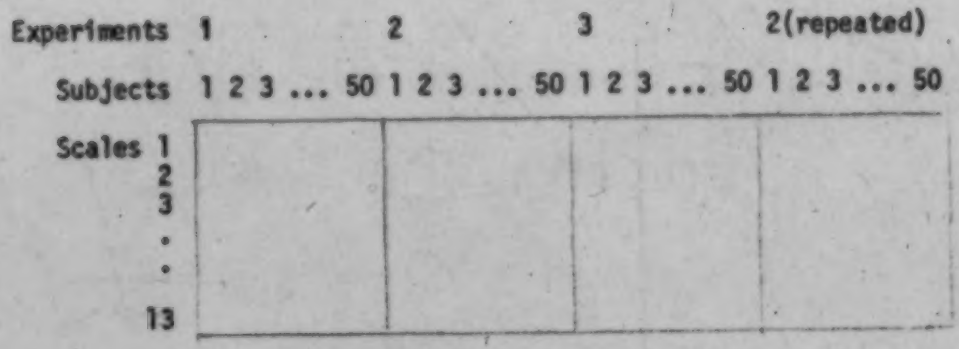

figure 9. Matrix of raw data for Study 4.

The correlation matrix for scales was computed across all 200 observations. This matrix was then factored by the Principal Components method and rotated to a Varimax solution. Factoring was arbitrarily stopped after three factors had been extracted, which coincided with the usual cutoff at eigenvalues less than unity. The factors are presented in Table 7. Factor scores were then computed, giving each S 12 scores in all, one

on each of the three factors for the four experiments he rated.

Preference between the three unordered pairs of experiments was treated as a single binary variable (+1 or -1) and regressed on the factor scores for the appropriate experiments. The entries in the cells of Table 8 indicate which of the nine original factor scores are entered in the six independent variables of the regression equation. In effect, therefore, the dependent variable is 'preference between any pair of experiments' and the independent variables are 'the relevant E, P and A scores for the experiments in question'. The results of this regression are in Table 9. The increase in the multiple correlation as P and A are added to E is plotted in Figure 10.

h^2		E	P	A
61	active	34	52	-46
65	soft	05	-80	10
69	unpleasant	-76	26	21
37	repetitive	-58	02	18
72	powerful	65	50	-22
74	interesting	81	00	-28
53	static	58	-41	16
74	large	42	56	49
64	good	79	07	-05
69	slow	-36	-01	75
71	strong	62	48	-31
65	meaningful	75	27	12
69	light	07	81	-17
% of common variance		52	32	17
% of total variance		33	21	10

Table 7. Varimax factors for Study 4.

Experiments	1			2			3			Dependent Variable: Preference between Experiments
Factor Scores on	E	P	A	E	P	A	E	P	A	(+1) (-1)
Independent Variables	1	2	3	4	5	6				1 and 2
	1	2	3				4	5	6	or 1 and 3
				1	2	3	4	5	6	or 2 and 3

Table 8. The assignment of the nine original variables to the six independent variables of the regression equation.

Independent variable	1	2	3	4	5	6	
	E	P	A	E	P	A	R
	-.40			.37			.53
		-.02			-.06		.07
			.12			-.14	.19
	-.40	.01		.37	-.03		.53
	-.40		.11	.35		-.09	.55
		-.03	.12		-.04	-.13	.20
	-.40	.00	.10	.35	-.01	-.09	.55

Table 9. Beta coefficients for the regression of preferences on factor scores. A blank cell denotes the deletion of a variable from the regression equation.

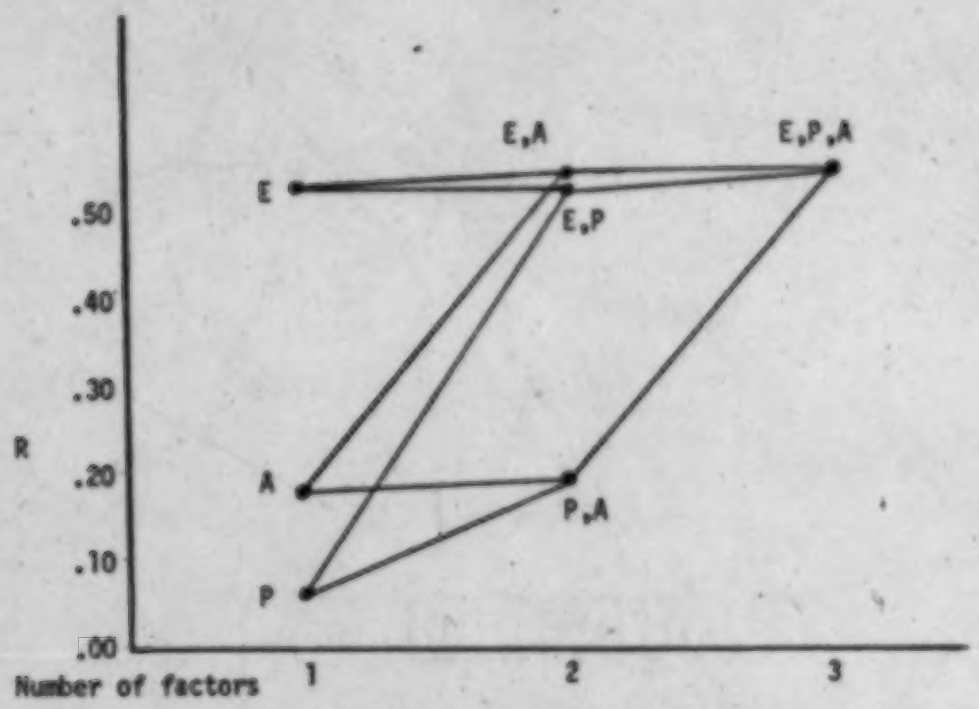

Figure 10. The increase in the multiple correlation as factors are added to the regression equation.

Discussion

The first factor is interpreted as Evaluation and the second as Potency. (For interpretative purposes, loadings of 40 and greater are presented below in Table 10.) The third factor is underdetermined but will be interpreted as Activity since it is consistent with this interpretation. The

interesting	81	light	81	slow	75
good	79	soft	-80	large	49
unpleasant	-76	large	56	active	-46
meaningful	75	powerful	50		
powerful	65	active	52		
strong	62	strong	48		
static	58	static	-41		
large	42				

Table 10. Loadings of 40 and greater on the three factors of Study 4.

fact that the active/passive scale loads elsewhere is not in itself a serious objection. A look at the various studies in Osgood et al. (1957) shows that few if any scales are reliable markers of the P and A dimensions. This is not the case for the E dimension, which is invariably marked by the good/bad scale. In these studies, however, the Potency and Activity interpretations of obtained factors are always a posteriori plausible, even if putative markers go astray. It was for this reason that a separate factor analysis was done in the present study. It is not difficult to think of items - say volcanoes or ulcers - for which the active/passive dimension will shift to the evaluative dimension. With the topic of 'psychology experiment' it is also debatable if the classic markers will be reliable, and so it was decided to make no assumptions.

In retrospect, the factors are much as Osgood would have expected. The results of the regression analysis, however, disconfirm his claim about the relation of P and A scores to behavior since there is only a negligible improvement in the multiple correlation as they are added to A scores.. The results support the idea that potential for influencing behavior is partialled out of P and A predications in the factor analysis and is exclusively the property of the E dimension.

It was possible to use some of the data collected to check another claim made earlier, that E, P and A are to be taken as predicates of the belief-mode and not the products of an 'affective' or 'metaphoric' mode. Since the literal interpretation of Factor III is 'big and slow', and since the political attitudes questionnaire was selected to be precisely this,

this experiment should score high on the factor relative to the two other experiments. It was possible to check this by looking at the mean scores on E, P and A for the three experiments. These are presented in Figure11.

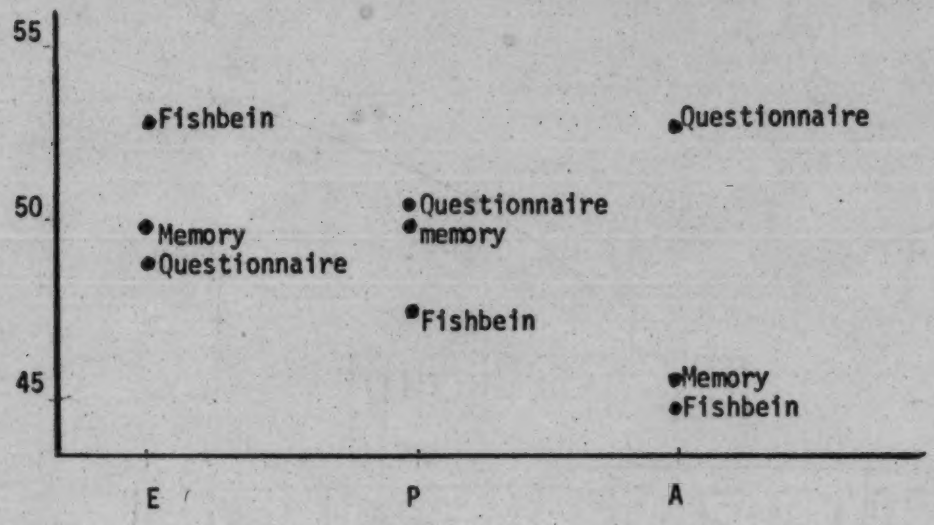

Figure 11. Mean factor scores for the three experiments on E, P and A.

The expectation concerning the Questionnaire is confirmed. No prior literal meanings could be found for the adjectives loading on the P; factor and so no expectations were formed on which experiments would score highest on it. In retrospect, 'potency' in the sense of 'seriousness' seems to be the obvious interpretation since the experiment on Fishbein's theory scores lowest and was considered amusing by all Ss.

In conclusion, it is ironic that we should have taken issue with Osgood as a means of proposing our model of mode-space. Many of his ideas are compatible with our position. The thought that there are several dimensions of 'meaning', each relevant to the entertainment which a content

receives, is similar to the idea of a multi-dimensional mode-space. In particular, the idea that beliefs may be 'affectively recoded' is along the general lines of this dissertation. In the long run, however, Osgood is committed to the dogma of the single mode by his empirical methods. The semantic differential records only beliefs. This is the source of the conflict we have been exploring.

By way of summary, the similarity of our objections to both Fishbein and Osgood may be pointed out. Fishbein recognizes a belief-mode and an affective or evaluative mode. Indeed, he has operationalized them more clearly than any other psychologist in his A and B scales (Fishbein and Raven, 1962). In other contexts, however, he denies propositional contents to the evaluative mode and claims that only contents representable by a single term may be entertained on this dimension. Study 3 showed that a more acceptable account of attitude formation can be given by construing the contents of both modes as propositional.

It is evident from Fishbein's writings that the incentive to disallow propositional contents in the affective mode comes from his interest in giving a traditional, learning theory reduction of this mode. Single term contents are much more amenable to such a reduction than propositions. Similarly, it is Osgood's interest in a non-mental interpretation of E, P and A which leads him to overlook the propositional materials which give rise to these factors. Imperceptibly the beliefs which the SD records become 'associations' and the predicate-factors become mediation responses. Study 4 questioned this transition by pointing out that evaluative beliefs have certain peculiarities which give them a monopoly on the prediction of

attitudinal behavior, which Evaluation as a component of a mediation response cannot have.

In the introduction it was said that intentional modes required a treatment that was closer in some ways to phenomenology than to the reductive empiricism of contemporary psychology. In effect, it is the reductionism of Fishbein's and Osgood's theories which has been the main source of contention in this chapter. The earlier chapters of the dissertation gave and empirical and theoretical vindication of the basic concept of a multi-dimensional space of ways to entertain a proposition. In this final chapter, Fishbein and Osgood were given as examples of theorists who have oversimplified this picture in the interests of reductionism. The studies presented make the point that the simplification is achieved at the expense of the prediction of behavior.

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Appendix 1.

Procedure for Study 1.

In an informal discussion, Ss were introduced to the general topic of 'tones of voice' and their role in ordinary language. They were told that while under normal circumstances 'tone of voice' conveys considerable information about a speaker's frame of mind, in the present experimental task it would difficult to pick this up since they would hear only the voice itself and have no idea of the facial expression s and other gestures accompanying it, or the context in which the expression was uttered. Some examples were played for them. They were encouraged to be imaginative in filling out the details of the scene taking place, but were asked to mark YES's and NO's only when they could hear the state of mind in the actual voice itself. If the voice gave no evidence for or against the frame of mind in the description, they were to use the zero position on the scale, never mind how often. There was no problem about time or the order in which they ticked off the desriptions; and they could hear any tone of voice as often as they wished.

Then they were asked to begin. As each tone of voice was presented, Ss described it on a checklist similar to that on the next page.

	YES NO	
She recommends	3 2 1 0 1 2 3	that it be on Sunday
She's interested	3 2 1 0 1 2 3	that it is on Sunday
She wants it to be	3 2 1 0 1 2 3	on Sunday
She believes	3 2 1 0 1 2 3	that it is on Sunday
She hopes	3 2 1 0 1 2 3	that it is on Sunday
She's amused	3 2 1 0 1 2 3	that it is on Sunday
She's glad	3 2 1 0 1 2 3	that it is on Sunday
She's asking	3 2 1 0 1 2 3	if it is on Sunday
It bugs her	3 2 1 0 1 2 3	that it is on Sunday
She knows	3 2 1 0 1 2 3	that it is on Sunday
She's excited	3 2 1 0 1 2 3	that it is on Sunday
She doubts	3 2 1 0 1 2 3	that it is on Sunday
She's worried	3 2 1 0 1 2 3	that it is on Sunday
She can't believe	3 2 1 0 1 2 3	that it is on Sunday
She requests	3 2 1 0 1 2 3	that it be on Sunday
She's sure	3 2 1 0 1 2 3	that it is on Sunday
She orders	3 2 1 0 1 2 3	that it be on Sunday
She suspects	3 2 1 0 1 2 3	that it is on Sunday
She thinks	3 2 1 0 1 2 3	that it is on Sunday
She's concerned	3 2 1 0 1 2 3	that it is on Sunday
She wonders	3 2 1 0 1 2 3	if it is on Sunday
She fears	3 2 1 0 1 2 3	that it is on Sunday
She expects	3 2 1 0 1 2 3	that it will be on Sunday
She's surprised	3 2 1 0 1 2 3	that it is on Sunday

NEITHER or
POSSIBLY (but it doesn't show)

Appendix 2.

Pilot studies, A, B, C, D.

These differ from Studies 1 and 2 mainly with respect to stimulus materials. In Studies A and B, sentences in the form 'I ϕ that p' were used. Ss rated these for appropriateness in their own case for a specified content 'p'. The scale for appropriateness had 6 points: very much so, a little, so-so, not really, definitely not, and, meaningless. In all the pilot studies the method of factoring was Principal Components followed by Varimax (orthogonal) and Promax (oblique) rotations.

Study A. For a constand mode-verb 'ϕ', Ss substituted 5 contents successively. The mode-verbs appear in Table 11. The five contents were

that I could be in a car crash
that Canada is a young country
that the instructions were on the first page
that hedgehogs make love cautiously
that I will finish this crummy experiment.

Thus, for 20 Ss and 20 mode-verbs, the complete matrix of ratings is 20x20x5. The matrix of correlations between mode-verbs was computed across all 100 observations. The loadings of the 5 factors obtained are presented in Table 11.

Study B was identical except that content was maintained constant while the mode-verbs were successively prefixed. It can be seen from Table 12

	h^2	I	II	III	IV	V
I'm glad	74	-54	40		34	34
I believe	70		64	49		
I'm amazed	54		-36		52	
I'm scared	75	83				
I'm determined	84			34	85	
I guess	69			82		
I wonder	60		-68			
I regret	63	77				
I intend	83				85	
I doubt	59		-68	-30		
I'm concerned	58	69		31		
I resent	47	60				
I suspect	70			83		
I remember	56		54		-44	
It bugs me	69	83				
I'm amused	43	-38	-44			
I see	76		79			
I'm impressed	71					84
I feel	60		31	60		
I'm proud	59					70
% of total variance		18	15	13	12	8

Table 11. Factor loadings for Pilot-study A.
(The loadings are taken from the pattern on primary axes.
Only loadings of 30 and greater are shown.)

	h^2	I	II	III	IV	V
I'm glad	68	-41	30	33	56	
I believe	74		58		54	
I'm amazed	42					61
I'm scared	69	80				
I'm determined	71			82		
I guess	71		82			
I wonder	62	30		-33	-50	37
I regret	69	81				
I intend	71		31	77		
I doubt	49			43	-50	
I'm concerned	60	70		30		
I resent	61	76				
I suspect	66		80			
I remember	67				80	
It bugs me	75	74	31			
I'm amused	58					70
I see	67		39		62	
I'm impressed	67					79
I feel	66		75			
I'm proud	67			52		
% of total variance		17	14	12	12	9

Table 12. Factor loadings for Pilot-study B.
(The loadings are taken from pattern on primary axes.
Only loadings of 30 and greater are shown.)

that the factors of Study A have been replicated.

In Study C the list of mode-verbs was increased by five. The 13 verbs underlined in Table 13 were added and 8 from the original list were deleted since they were considered to be unnecessary for recovering the same factor structure. Ss were asked to pick a content for which a given mode verb definitely applied to themselves, i.e. something they would definitely be glad, amused, concerned, etc. about (if it were the case). Then they were asked to record the extent to which the other mode verbs were appropriate in this same situation, for this same content. Each S did this for 5 mode verbs. There were 14 Ss and thus the total matrix of ratings is 14x25x5, as illustrated in Figure 12.

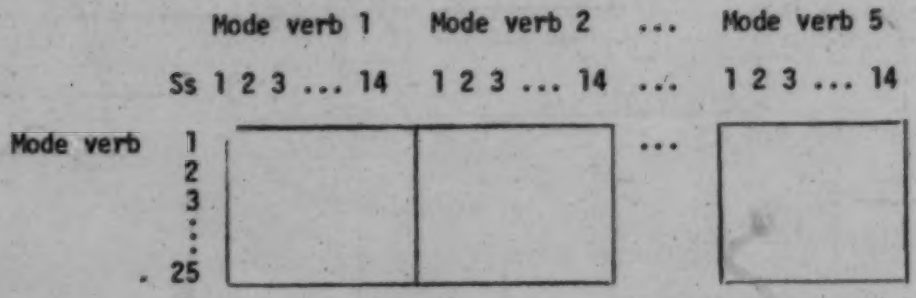


Figure 12. Matrix of raw data for Pilot -study C.

The matrix of correlations between verbs was calculated across all 70 observations. The factors obtained are presented in Table 13.

For Study D, 25 drawings were prepared showing some person in a situation for which a caption in the form 'He øs that p' was appropriate. Each of 16 Ss received 5 of these drawings and rated the appropriate-

	h^2	I	II	III	IV	V	VI	VII	VIII
I'm sure	74					85			
I'm annoyed	82	85							
I wish	79	-33			80				
I couldn't care less	70							-79	
I demand	73		82						
I'm concerned	68	45						62	
I'm determined	77		69		33				
I wonder	68				56	-30	45		
It bugs me	79	88							
I'm glad	82	-38		65	34				
I promise	57		58						
I suspect	75						82		
I'm proud	75	-32		63	31				
I believe	72					65	39		
I'm amused	78			59				-52	
I'm impressed	75			77					
I'm surprised	71	46		65					
I'm bothered	80	75			-40				
I feel	79					39	71		
I threaten	67		41						66
I'm well aware	83				30	79			
I'm apologetic	62	42	-31						-55
I intend	76		65		36			31	
I'm excited	64			45	64				
I'm emphatic	66		75						
% of total variance		13	12	11	10	9	7	6	5

Table 13. Factor loadings for Pilot-study C.

(The loadings are taken from pattern on primary axes.

Only loadings of 30 and greater are shown.)

	h^2	I	II	III	IV	V	VI	VII
I'm sure	74							
I'm annoyed	86	-76	-38					
I wish	62							
I couldn't care less	75					-85		
I demand	75		81					
I'm concerned	71	-34		30		66		
I'm determined	73	40	63	36				
I wonder	77			57	-63			
It bugs me	88	-73	-46					
I'm glad	91	85	35					
I promise	76		46		-43		43	
I suspect	72			83				
I'm proud	81	84						
I believe	77			45	71			
I'm amused	64	73						
I'm impressed	80	79				31		
I'm surprised	78		-60			59		
I'm bothered	85	-78	-31				34	
I feel	71		30	75				
I threaten	66		78					
I'm well aware	84				86			
I'm apologetic	90							94
I intend	68		74					
I'm excited	76	72					32	
I'm emphatic	49		62					
% of total variance		22	18	10	9	7	5	5

Table 14. Factor loadings for Pilot-study D.

(The loadings are taken from pattern on primary axes. Only loadings of 30 and greater are shown.)

ness of the other mode verbs as substituted for 'ø' in the same caption. In this case, the matrix of ratings is 16x25x5, as in Figure 13.

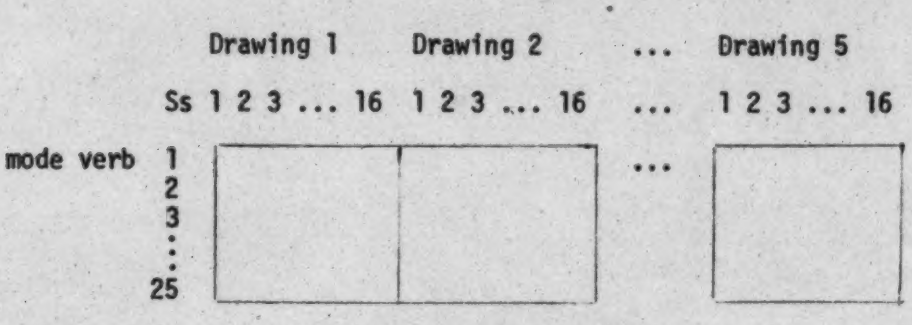


Figure 13. Matrix of raw data for Pilot-study D.

The matrix of correlations between mode verbs was calculated across 80 observations, and the factors obtained from it are presented in Table 14.

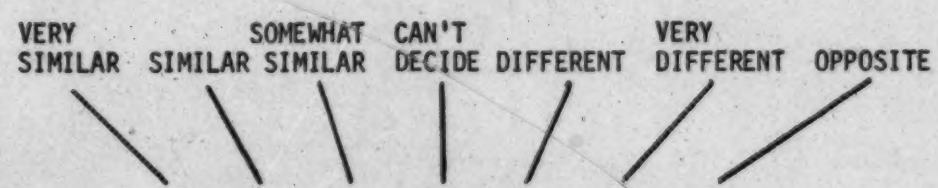
The modifications in studies A thru D were attempts to cope with one over-riding problem: the tendency of Ss to change the content with the mode. For example, in Study D, a character is depicted as 'wishing that he stayed at home' (because the party is a bore). At the same time he is consistently rated as 'being bugged'. But this cannot be 'being bugged that he stayed at home' but rather 'being bugged that he did not stay at home'. Similarly, a character who is 'demanding that he (will) get an explanation' is rated as 'threatening' though this predication cannot sensibly be made without shifting the content. What is threatened is something or other if the character in question does not get his explanation. This is interesting in its own right since it indicates that Ss more readily locate a moded content in a

network of others across different contents, and find it difficult to read off the values of a fixed content on modes taken abstractly. This is the problem which was finally resolved by using linguistic material.

Appendix 3.

Procedure for Study 2.

Ss rated 136 pairs of intonations for similarity or difference of the speaker's 'frame of mind on scales similar to those presented below. Each line of numbers is for a separate pair. Ss were told to use the DIFFERENT and CAN'T DECIDE categories if they felt there was no real comparison between the tones of voice. They were asked to give extreme responses only when they felt sure that the speaker must be feeling very similar or very different in the two utterances. An informal discussion of tones of voice was interspersed between the judgments to break the monotony.



	3	2	1	0	1	2	3	
	3	2	1	0	1	2	3	
	3	2	1	0	1	2	3	
	3	2	1	0	1	2	3	
SIMILAR	3	2	1	0	1	2	3	OPPOSITE

Appendix 4.

Procedure for Study 3 (on Fishbein's attitude theory).

Ss were presented with a page similar to that overleaf, and were then instructed as follows:

> On the left of this page here is a list of characteristics which a person might or might not have. In the column of numbers immediately following, I want you to record whether you consider these to be good things or bad things for a person to have. In other words, whether these are things that turn you on or turn you off about people. The zero means it doesn't bother you one way or the other. And the 1, 2 and 3 are for increasing goodness or badness. So, if you will, work your way down through the first block of numbers, and then I'll tell you what to do with the next block....
>
> For the next block of numbers I want you to imagine that you have been assigned a STUDY PARTNER for some course you are taking. You are going to be studk with the gut for the rest of the term, whether you like it or not. Now, you haven't met him yet, but you know for sure that he WEARS GLASSES, is GOING BALD, is HEALTHY, and so on. This is all you know about him; and it's definitely true. So, in this block of numbers I want you to record how bothered or how happy you would be to find out that your prospective STUDY PARTNER is going to be each of these things.

Ss then complete the second block of numbers. As soon as they are finished, the experimenter continues:

> Underneath, where it says HI/LO I want you to rate the chances that the guy will be ok, in your opinion. Is there a high chance, or a low chance that you are going to get on with him. Or is it still just 50/50....
>
> Things take an unexpected turn in the third column. Here, I want you to say how true or how false it is, in your opinion, that our PRIME MINISTER, PIERRE ELIOT TRUDEAU, is each of these things. 'Trudeau wears glasses': true or false. 'Trudeau is going bald': true or false. And so on for the others. The zero can mean either 'half true, half false' or 'don't know'. So fill out this column now, if you will.

	GOOD							BAD	BOTHERED							HAPPY	TRUE							FALSE	BOTHERED							GLAD
WEARS GLASSES	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
GOING BALD	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
HEALTHY	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
FRENCH-SPEAKING	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
WITTY	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
ARROGANT	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
FLASHY DRESSER	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
INTELLIGENT	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
MARRIED	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
ATHLETIC	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
GOOD-LOOKING	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
MIDDLE-AGED	3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3		3	2	1	0	1	2	3	
									HI	3	2	1	0	1	2	3	LO								HI	3	2	1	0	1	2	3	LO

When Ss finished, the experimenter continued:

> In the last column, just like the second one, I want you to record whether it bothers you or makes you happy that TRUDEAU is or is not each of these things. Is it a source of satisfaction to you that he is - say, intelligent (if you already said he was); or does it bug you instead. The zero means it doesn't bother you one way or the other....
>
> And underneath, your overall opinion of TRUDEAU. Do you have a high opinion of him, or a low one, or none.

This concluded the experiment. Ss were told briefly about the analysis that would be done on the data, and what the expectations were.

Appendix 5.

Procedure for Study 4 (on Osgood's Semantic Differential).

The data was collected at various points in the course of a multiple experiment. Ss were told that their opinions were being sought on psychology experiments in general. Their task was introduced as follows:

> You could call this an experiment about experiments. What it is, is extracts from three different experiments which I am actually doing at the same time as this one. I'll get you to go through these extracts, and afterwards your data will be returned to the experiments themselves. But what I am more interested in is your general reaction to the extracts, whether you find them boring or interesting, which you prefer, and so on. So, after you have been exposed to each and got the feel of it, I will get you to rate it on one of the pages of this booklet here.

(A rating sheet is reproduced overleaf.)

> Now, some of the things you have to rate the experiments for, sound strange. There's no problem about INTERESTING vs BORING, or GOOD vs BAD. But what about SOFT vs HARD, or LARGE vs SMALL? Well, this is where you have to use your imagination and become slightly poetic. For instance, take the word LULLABY. Strictly speaking you cannot rate is as either HARD or SOFT since it isn't really either. But most people would pick SOFT to describe it, rather than HARD. I want you to try to do the same sort of thing these scales here when you try to describe the various experiments with them. And if the worst comes to the worst and you think there is no possible sense of, say, HARD or SOFT, that applies to the experiment you have just done, then mark the zero, which means NEITHER - though it can also mean 'half and half'.

At this point the first extract from an experiment was introduced. It was a memory task with audio-visual presentation. The details are of no importance here. The task was moderately difficult and took

I rate this experiment

active	3	2	1	0	1	2	3	passive
soft	3	2	1	0	1	2	3	hard
unpleasant	3	2	1	0	1	2	3	pleasant
repetitive	3	2	1	0	1	2	3	varied
powerful	3	2	1	0	1	2	3	powerless
interesting	3	2	1	0	1	2	3	boring
static	3	2	1	0	1	2	3	dynamic
large	3	2	1	0	1	2	3	small
good	3	2	1	0	1	2	3	bad
slow	3	2	1	0	1	2	3	fast
strong	3	2	1	0	1	2	3	weak
meaningful	3	2	1	0	1	2	3	meaningless
light	3	2	1	0	1	2	3	heavy

about three minutes to complete. When Ss had finished, the experimenter continued:

> Now, if you were doing the actual experiment from which this extract was taken, we would go on and on, repeating things till you got them all right, then swapping them round , and so on. Right now, however, all I am interested in is your general reaction to this type of experiment. So I want you to turn to this rating booklet here and say what you think about this memory task.

When Ss finished their ratings, the second extract was introduced. This was a 300 item political attitudes questionnaire, selected for its great length and monotony. After some introductory remarks about the nature of the questionnaire, the experimenter went on:

> But all I am interested in right now is what you think of this as an experiment you might be asked to take part in. And to get a feel for what it is like, all you need to do is the first page. Later on, if there is time, I may ask you to do some more, because the more data we have on this the better. But for now, just do the first page, if you will, and then turn to the rating booklet here and say what you think of it, just as you did for the last expermient.

The third extract was the previously reported Study 3. As soon as they had finished, Ss were again asked to rate it on the SD scales.

The remainder of the experiment was concerned with obtaining two measures of attitudinal behavior towards the three experiments. The first measure was a stated preference among the experiments and was obtained in the following way.

> By now you should have some opinions on which of these three experiments you would choose to do if you were forced to do one or the other. So, on this blank page here I want you to write down your first, second and third preferences. Write

> down the Roman numerals I, II and III to stand for the three experiments. Roman numeral I stands for the memory task with Ruth, Kate, Gail and their friends; Roman numeral II stands for the political attitudes questionnaire; and Roman numeral III stands for the experiment you have just completed about Trudeau and your study-partner. Put an ordinary 1, 2 or 3 underneath the Roman numerals to indicate your preference, in other words, your first choice, your second choice and your third choice.

The second measure of attitudinal behavior was to be the number of items of the political attitudes questionnaire which Ss would be willing to complete voluntarily, after the main experiment was finished. This measure was in fact taken. But, as mentioned in the dissertation, it showed no relation with any of the prior measures of attitude and was therefore of no further interest.